Palmdale Hybrid Power Project

Responses to CEC Data Request Set 2 (91-162) and Supplemental Responses #4 to CEC Data Request Set 1

Docket 08-AFC-9

Submitted on Behalf of

PALMDALE
a place to call home

Submitted by

Inland Energy, Inc.

Submitted to
California Energy Commission
May 1, 2009

Prepared by

AECOM

PALMDALE HYBRID POWER PROJECT

Responses to CEC Data Request Set 2 (91-162) and
Supplemental Responses to CEC Data Request Set 1
Docket No. 08-AFC-9

Submitted on behalf of:
City of Palmdale

by:
Inland Energy, Inc.

Submitted to:
California Energy Commission

Prepared by:
AECOM Environment

May 1, 2009

The following two reports are included below as part of the Set 1 Data Requests initially submitted on January 12, 2009. These special-status species surveys were recently completed and are presented below in response to Data Request 1.

Data Request 1:

> Please conduct and provide the results of the upcoming special-status species surveys for sensitive biological resources during the appropriate season(s) along the Section 1 transmission line right of way (ROW), which were not surveyed prior to filing the AFC.

Response:

Please see attached special-status species survey reports:

Swainson's Hawk Nesting Survey

Special-Status Species (BRTR) Survey Addendum

Biological Resources

Swainson’s Hawk Nesting Survey

PALMDALE HYBRID POWER PROJECT

FINAL

SWAINSON'S HAWK NESTING SURVEY
LOS ANGELES COUNTY, CALIFORNIA

Prepared for:
City of Palmdale, California and Inland Energy
Under subcontract to
AECOM Environment
1220 Avenida Acaso
Camarillo, California 93012-8738
Office: (805) 388-3775
Fax: (805) 388-3577

Contact: Ms. Sara Head
sara.head@aecom.com

Prepared by:
AMEC Earth & Environmental, Inc.
3120 Chicago Avenue, Suite 110
Riverside, California 92507
Office: (951) 369-8060
Fax: (951) 369-8035

Principal Investigator:
Matt Amalong, Wildlife Biologist
matt.amalong@amec.com

April 2009
AMEC Project No. 6554000247

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 Purpose and Need

AMEC Earth & Environmental, Inc. (AMEC) was contracted by AECOM Environment (AECOM) to prepare a Biological Resources Technical Report (BRTR) for the development of the proposed Palmdale Hybrid Power Project (PHPP or Project), a nominal 570-megawatt (MW) hybrid combined-cycle/solar thermal electrical generation facility. Swainson's hawk (*Buteo swainsoni*), a species listed as threatened under the California Endangered Species Act (CESA), was identified in the BRTR as a species known from the Project region. In response to the California Energy Commission's Palmdale Hybrid Power Project (08-AFC-9) Data Request #17, dated December 10, 2008, AMEC conducted nesting surveys in 2009 for Swainson's hawks.

1.2 Project and Property Description

The Project is located in the City of Palmdale (City) and unincorporated areas of Los Angeles County, California (the power plant site and most linear facilities are within the City of Palmdale; portions of the transmission line route are within unincorporated areas), and includes a 333-acre power plant site, 50-acre construction laydown area, 35.6-mile transmission line, 7.4-mile reclaimed water pipeline, 8.7-mile natural gas supply pipeline, 1-mile sanitary wastewater pipeline, and 0.5-mile potable water pipeline (Figure 1). Throughout this report, the term "Project Site" refers to all Project elements in the aggregate (power plant site and all linear facilities); "linear facilities" refers to the various Project pipelines and the transmission line in the aggregate; all other references are to the specific Project component being addressed ("power plant site" or "plant site," "transmission line," "reclaimed water pipeline," "natural gas supply pipeline," "sanitary wastewater pipeline," and "potable water pipeline").

1.3 Swainson's Hawk Background

Swainson's hawks are an uncommon breeding resident and migrant in the Antelope Valley (Bloom 1980). They breed from late March to August, typically utilizing a solitary tree, bush, small grove, or line of trees along a riparian corridor. Typical nest trees include willows (*Salix* spp.), black locusts (*Robinia pseudoacacia*), box elders (*Acer negundo*), junipers (*Juniperus* spp.), oaks (*Quercus* spp.), aspens (*Populus* spp.), and cottonwoods (*Populus* spp.) (England *et al.* 1997). A small number of nests have been reported on human-built structures such as power poles or transmission towers (Olendorff *et al.* 1981). Swainson's hawks forage in grasslands, agricultural fields, or livestock pastures up to 18 miles from their nest (Estop 1989, Babcock 1993).

In southern California, the Swainson's hawk population may have declined by more than 90 percent during the 1900s (Bloom 1980). They were historically abundant, with a wide breeding range. As a result of loss of nesting habitat because of human development, they are now mostly limited to spring and fall transients in southern California.

2.0 SURVEY METHODOLOGY

The Swainson's Hawk Technical Advisory Committee (SHTAC) developed a set of survey recommendations - *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (SHTAC 2000; Appendix 2) - to maximize the potential for locating nesting Swainson's hawks, thus reducing the potential for nest failures as a result of project activities/disturbances. This survey protocol meets the California Department of Fish and Game (CDFG) recommendations for mitigation and protection of Swainson's hawks. Survey methodology for PHPP adhered to these survey protocols.

Surveys were conducted for a 1-mile radius around the power plant site and a 0.5-mile radius around the linear facilities. AMEC biologists Stephen Myers, Chet McGaugh, John Green, and Mike Wilcox, all knowledgeable in Swainson's hawk habitat, ecology, and field identification (see Appendix 1 for surveyor qualifications), conducted surveys from March 16 through April 15.

2.1 Records Search

Prior to the field surveys, a records search was conducted to identify the historical occurrences of Swainson's hawks in the Project vicinity. The CDFG California Natural Diversity Data Base (CNDDB) for Los Angeles County was queried (CDFG 2009). During Survey Period III (Section 2.4), these historic sites were visited to determine their current status. Personal communications with Scott Harris (CDFG Biologist) and Pete Bloom (Swainson's hawk expert) were also made to confirm the historic nest locations and determine other potential nesting sites.

2.2 Survey Period I (Jan 1 – Mar 20)

Survey Period I included two surveys on March 16 and 17, 2009, to determine potential nest locations. Most nests are easily observed from relatively long distances, giving the surveyor the opportunity to identify potential nest sites and locate and map nest sites of competing species, such as great horned owls (*Bubo virginianus*), red-tailed hawks (*Buteo jamaicensis*), and common ravens (*Corvus corax*).

2.3 Survey Period II (Mar 21 – Apr 5)

Survey Period II included three surveys on March 27 and 31, 2009, and April 2, 2009. Most Central Valley Swainson's hawks return by April 1, and immediately begin occupying their traditional nest territories. (The Central Valley is sufficiently close and has similar weather cycles as the Project Site, so Central Valley Swainson's hawks can serve as a behavioral analogy for those in the PHPP area.) For those few that do not return by April 1, there are often hawks ("floaters") that act as place-holders in traditional nest sites; these are birds that do not have mates, but temporarily attach themselves to traditional territories and/or one of the site's "owners." Floaters are usually displaced by the territories' owner(s) if the owner returns.

Most trees are leafless and are relatively transparent in March, so it is easy to observe old nests, staging birds, and competing species. The hawks are usually in their territories during the survey hours, commonly soaring and foraging in the mid-day hours. Swainson's hawks may often be observed involved in territorial and courtship displays. Potential nest sites identified by the observation of staging Swainson's hawks will usually be active territories during that season, although the pair may not successfully nest/reproduce that year.

2.4 Survey Period III (Apr 6 – Apr 20)

Survey Period III included three surveys on April 13, 14, and 15, 2009. Although trees are much less transparent at this time, activity at the nest site increases significantly. Both males and females are actively nest-building, visiting their selected site frequently. Territorial and courtship displays are increased, as is copulation. The birds tend to vocalize often, and nest locations are most easily identified. Also, potential nest sites, as determined during previous surveys, and historical nesting sites (CNDDB records) were visited to determine their current status.

2.5 Survey Period IV (Apr 21 – Jun 10)

No Swainson's hawk individuals or nests were observed during Survey Periods I, II, and III, so no surveys will be conducted during Survey Period IV. If Swainson's hawk nests are observed in future breeding/nesting seasons during Project construction, the following Survey Period IV methodology will be implemented to monitor the nests and young.

During this phase of nesting, the female Swainson's hawk is in brood position, very low in the nest, laying eggs, incubating, or protecting the newly hatched and vulnerable chicks; her head may or may not be visible. Nests are often well-hidden, built into heavily vegetated sections of trees or in clumps of mistletoe, making them all but invisible. Trees are usually not viewable from all angles, which may make nest observation impossible.

Following the male to the nest may be the only method to locate it, and the male will spend hours away from the nest foraging, soaring, and will generally avoid drawing attention to the nest site. Even if the observer is fortunate enough to see a male returning with food for the female, if the female determines it is not safe she will not call the male in, and he will not approach the nest; this may happen if the observer, or others, are too close to the nest or if other threats, such as rival hawks, are apparent to the female or male.

2.6 Survey Period V (Jun 11 – Jul 30)

Three surveys will be conducted between June 11 and July 30, 2009 to determine if any Swainson's hawks are in the area, as well as to re-visit historical nest sites. After hatching, young hawks are active, visible, and relatively safe without parental protection. Both adults make numerous trips to the nest and are often soaring above, or perched near or on the nest tree. The location and construction of the nest may still limit visibility of the nest, young, and adults.

3.0 RESULTS

3.1 Records Search

CNDDB records did not indicate the historical presence of Swainson's hawks within the Project Site or survey area (1-mile radius around power plant site, 0.5-mile radius around linear facilities), but they have been observed in the Project vicinity (Figure 2). Five occurrence records in Los Angeles County from 1979 to 2005 range from 3 to 16 miles from the Project Site (CDFG 2009; Appendix 3). These sites were visited during Survey Period III to determine their current status.

SWHA 1. 1979: one adult at nest approximately 3 miles from transmission line segment

2009: no nest observed.

SWHA 2. 1996-1999: two adults and two young at nest (1996) approximately 3 miles from transmission line segment 1; one adult at same nest (1999).

2009: nest observed, but no Swainson's hawks observed. Will re-visit in Survey Period V.

SWHA 3. 1999: one adult approximately 3.5 miles from transmission line segment 1; no nest observed.

2009: one great-horned owl nest observed near the record's coordinates.

SWHA 4. 1999: two adults at nest approximately 16 miles from power plant site.

2009: not visited.

SWHA 5. 2005: two adults at nest approximately 6.5 miles from transmission line segment 1.

2009: nest trees no longer present.

3.2 Survey Periods I, II, and III

No Swainson's hawks were observed during Survey Periods I, II, and III. Twenty (20) nest sites of competing species (red-tailed hawk, great-horned owl, common raven) were located and mapped (Table 1; Figure 2).

Table 1. Raptor/Corvid Nest Locations

ID	UTM NAD 83		Species	Location
	Easting	Northing		
1	398063	3834106	Red-tailed hawk	Joshua tree
2	408933	3819219	Unknown (inactive)	Steel transmission line tower
3	409544	3836005	Red-tailed hawk	Cottonwood tree
4	408707	3835945	Great horned owl	Steel transmission line tower
5	405493	3835898	Common raven	Elm tree
6	403423	3835915	Great horned owl	Pine tree
7	402080	3835771	Common raven	Joshua tree
8	398029	3833414	Common raven	Joshua tree
9	397364	3830219	Unknown (inactive)	Joshua tree
10	402899	3829092	Red-tailed hawk	Cottonwood tree
11	417010	3823839	Common raven	Joshua tree
12	406368	3835603	Unknown (inactive)	Joshua tree
13	403311	3835931	Unknown (inactive)	Elm tree
14	401838	3829448	Common raven	Wood transmission line pole
15	412713	3829378	Common raven	Joshua tree
16	410925	3835849	Unknown (inactive)	Cottonwood tree
17	398171	3833747	Common raven	Joshua tree
18	397690	3833500	Unknown (inactive)	Joshua tree
19	399738	3829510	Common raven	Wood transmission line pole
20	401034	3829473	Unknown (inactive)	Wood transmission line pole

4.0 DISCUSSION

No Swainson's hawks were observed in the Project vicinity (1-mile radius of power plant site and 0.5-mile radius of linear facilities) during the 2009 breeding season. Preferred nesting habitat is not found on the Project Site. Therefore, the Project is not anticipated to have any direct adverse impacts on nesting individuals.

Swainson's hawks are known to forage up to 18 miles from nest sites (Estop 1983, Babcock 1993). Historic records of Swainson's hawk nests are located within foraging distance of the Project, but currently these historic records are not active Swainson's hawk nests. There is the possibility that Swainson's hawks are nesting within 18 miles of the Project. If they are, it is possible that potentially suitable foraging habitat could be impacted by the Project (5.08 acres of agricultural land), thereby indirectly impacting nesting individuals and potentially contributing to cumulative impacts in the Antelope Valley (*i.e.,* continued development, conversion of agricultural crops to unsuitable foraging habitat).

Nest sites of competing species that were located in 2009 could be used by Swainson's hawks in the future, so if PHPP construction activities occur during the 2010 breeding season or longer, additional surveys may be needed.

5.0 REFERENCES

AMEC. 2008. Palmdale Hybrid Power Project: Biological Resources Technical Report. Unpublished report dated July 2008 and submitted to the California Energy Commission as part of an Application for Certification.

Babcock, K.W. 1993. Home range and habitat analysis of Swainson's hawks in West Sacramento. Michael Brandman Associates report prepared for the Southport Property Owner's Group, City of West Sacramento, CA. 21 pp.

Bloom, P.H. 1980. The status of the Swainson's Hawk in California, 1979. Nongame Wildlife Invest, Job II-8.0. Wildlife Mgmt. Branch, Calif. Dept. of Fish Game, Sacramento, CA.

California Department of Fish and Game (CDFG). 1994. State Fish and Game Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California.

California Department of Fish and Game (CDFG). 2009. California Natural Diversity Data Base, Rarefind 3, Version 3.1.0.

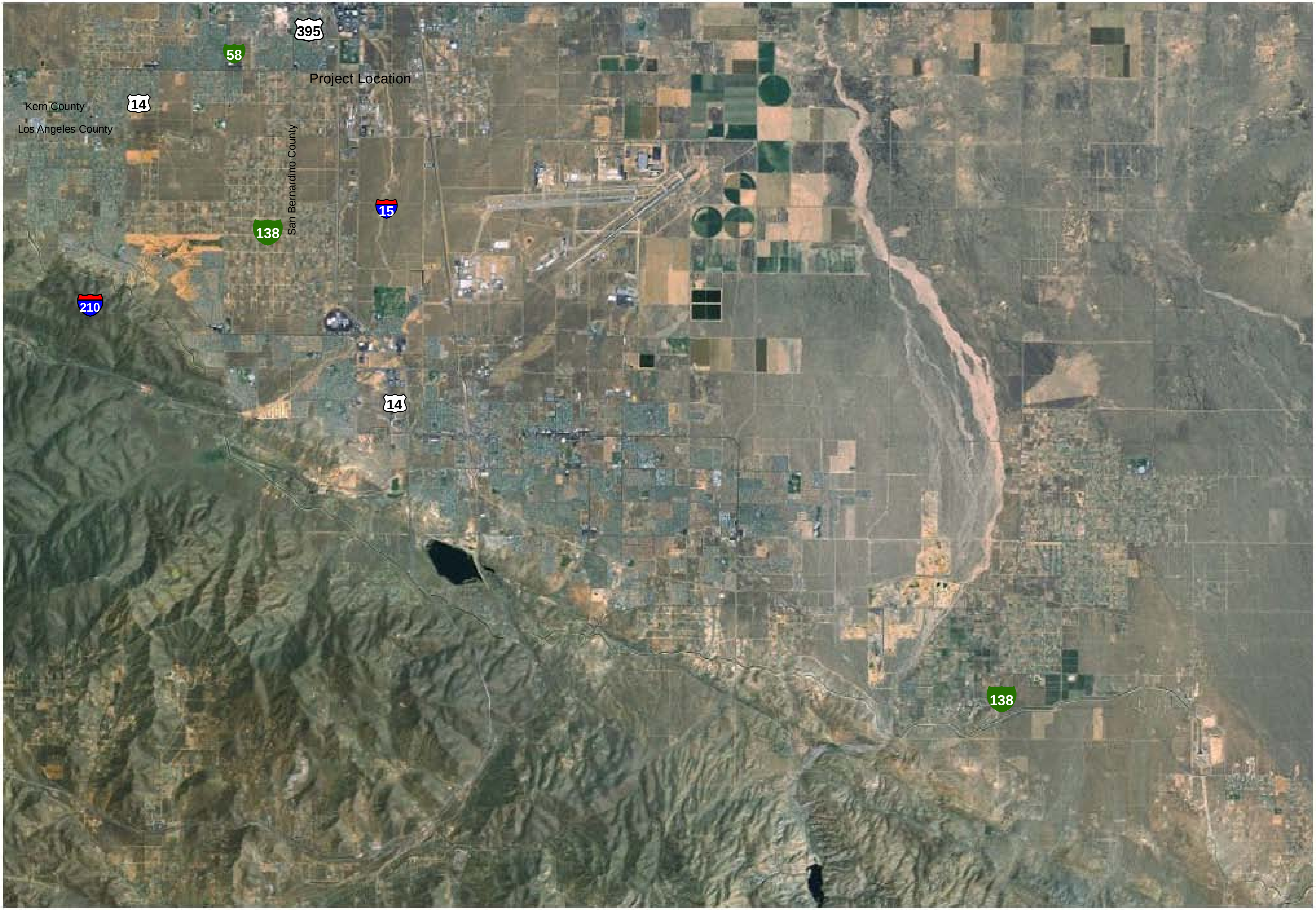
England, A. Sidney, Marc J. Bechard and C. Stuart Houston. 1997. Swainson's Hawk (*Buteo swainsoni*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/265

Estep, J.A. 1989. Biology, movements, and habitat relationships of the Swainson's Hawk in the Central Valley of California, 1986-87. Calif. Dept. of Fish and Game, Nongame Bird and Mammal Section Report, 53 pp.

Olendorff, R. R., A. D. Miller, and R. N. Lehman. 1981. Suggested practices for raptor protection on power lines: the state of the art in 1981. Raptor Res. Rep. no. 4.

Swainson's Hawk Technical Advisory Committee. 2000. Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley.

FIGURES



Legend

Power Plant Site Survey Area
Transmission Line
Potable Water
Sanitary Wastewater Pipeline
Natural Gas Pipeline
Reclaimed Water Pipeline

Palmdale Hybrid Power Project

Figure 1

Vicinity & Location

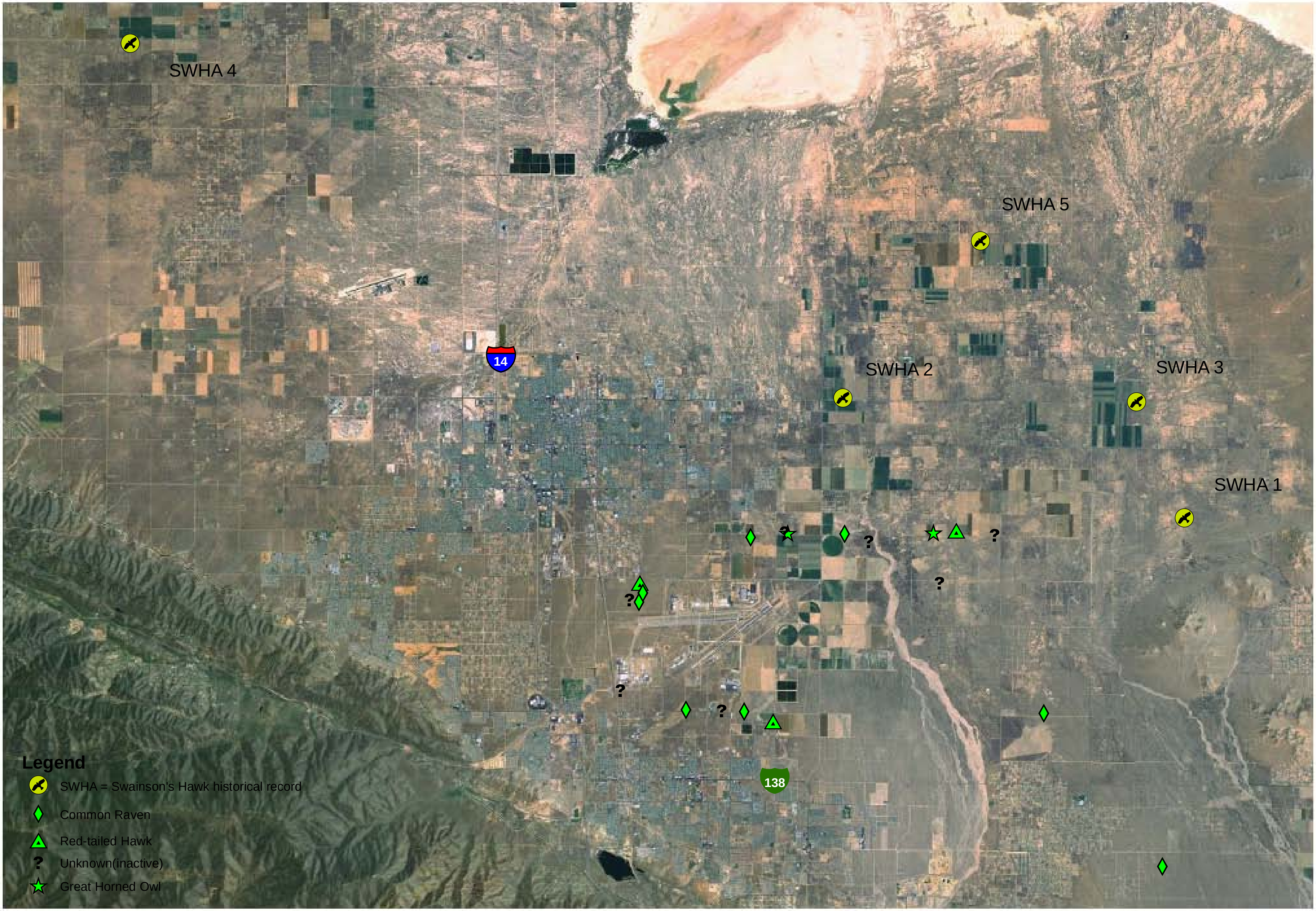
0 1 2 3 4 Miles

1:125,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 04/10/09

N



Power Plant Site Survey Area
Transmission Line
Potable Water
Sanitary Wastewater Pipeline
Natural Gas Pipeline
Reclaimed Water Pipeline

Palmdale Hybrid Power Project

Figure 2

Raptor Nests & Swainson's Hawk Historical Records

0 2 4 Miles

1:185,116

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 04/16/09

N

APPENDICES

APPENDIX 1

QUALIFICATIONS OF INDIVIDUALS CONDUCTING STUDIES

John F. Green, B.Sc.

Wildlife Biologist

Professional summary

Mr. Green has a broad background in field biology, including experience with birds, mammals, reptiles, amphibians, insects, and plants. In Southern California he has extensive experience in Riverside, San Bernardino, Los Angeles and Imperial Counties. He has also worked on numerous projects in Kern, Mono, Orange, San Diego, and Santa Barbara Counties as well as in Northern California, Nevada, and beyond. Professional experience includes: general biological surveys for wildlife and plants; focused sensitive, threatened, and endangered wildlife and plant species surveys; project management; monitoring for sensitive, threatened, and endangered species; sensitive species exclusion and relocation; small mammal trapping studies, vegetation mapping; revegetation and revegetation monitoring; seed collecting; and the preparation of documents and reports related to those projects.

Professional qualifications

Permits

Independent Investigator for California Gnatcatcher on Federal Threatened/Endangered Species Permit, # TE-054011-2 (surveys and nest monitoring)

Independent Investigator for Least Bell's Vireo on Federal Threatened/Endangered Species Permit, #TE-054011-2 (nest monitoring)

Independent Investigator for Southwestern Willow Flycatcher on Federal Threatened/ Endangered Species Permit, # TE-054011-2 (surveys and nest monitoring)

Independent Investigator for the Quino Checkerspot Butterfly on Federal Threatened/ Endangered Species Permit #TE-054011-2

Independent Investigator for the Yuma Clapper Rail on Federal Threatened/ Endangered Species Permit #TE-054011-2

Supervised Investigator for California Red-legged Frog on Federal Threatened/ Endangered Species Permit # TE785148-10

Supervised Investigator for Stephens' Kangaroo Rat on Federal Threatened/Endangered Species Permits #TE804203-7 and TE785148-10

Supervised Investigator on Federal Threatened/Endangered Species Permit for San Bernardino Kangaroo Rat, #TE804203-7

Supervised Investigator for Pacific Pocket Mouse on Federal Threatened/Endangered Species Permit # TE785148-10

Subpermittee on Federal Bird Marking (Bird Banding) and Salvage Permit #23035-D

Field Investigator on Memorandum of Understanding (MOU) from the California Department of Fish and Game for California Black Rail, Yuma Clapper Rail, Western Yellow-billed Cuckoo, Elf Owl, Gila Woodpecker, Willow Flycatcher, Least Bell's Vireo, California Gnatcatcher, Palm Springs Pocket Mouse, Los Angeles Pocket Mouse, Stephen's Kangaroo Rat, and San Bernardino Kangaroo Rat

Field Assistant on Memorandum of Understanding (MOU) from the California Department of Fish and Game for Mohave Ground Squirrel and Mojave River Vole

Scientific Collecting Permit #SC-005605 California Department of Fish and Game

Rare, Threatened, and Endangered Plant Voucher Collecting Permit #08066 California Department of Fish and Game

Certifications

Wetland Training Institute Arid West Supplement 2007

San Diego Vernal Pool Flora and Habitat Restoration 2007

Wetland Delineator 2005

The Desert Tortoise Council Survey Workshop 2002

Education

BS, Entomology University of California, Riverside, CA, 1991

AA, Biology, Fullerton College, Fullerton, CA, 1989

Additional training

Yellow-billed Cuckoo Workshop and Training, 2007

CEQA Basics Workshop, 2006

Southwestern Willow Flycatcher Survey Training Workshop, 2002

Identification of California Branchiopod Crustaceans Workshop (Fairy Shrimp and Tadpole Shrimp) 2002

California Native Plants Seed Collecting and Storage, Rancho Santa Ana Botanic Garden, Claremont 2002

Plant Identification and Ecology, University of California Extension, Riverside, 2002

Rapid Assessment Method Vegetation Training Workshop, California Native Plant Society, San Diego 2002

South Coast Missing Linkages Workshop, University of Redlands, Redlands 2002

Survey of the Major Plant Families of Southern California, Rancho Santa Ana Botanic Garden, Claremont 2002

Introduction to Bird Banding, University of California Extension, Riverside, 2001

Field Study of Birds: Spring, University of California Extension, Riverside, 2001

Field Study of Birds: Winter, University of California Extension, Riverside, 2001

Field Study of Birds: Fall, University of California Extension, Riverside, 2000

Birding by Ear-An Intermediate/Advanced Birding Skills Workshop, Sea and Sage Audubon Society, 1997

Birding With Your Ears Workshop, Sea and Sage Audubon Society, 1996

Birding Workshop, Sea and Sage Audubon Society, 1992

Memberships

American Birding Association

California Native Plant Society

Desert Tortoise Council

Western Field Ornithologists

Xerces Society (invertebrate biodiversity)

Language

English

Summary of core skills

Mr. Green has had a lifelong interest in the natural history of Southern California. This has given him a broad background in field biology, including extensive experience with birds, mammals, reptiles, amphibians, insects, and plants as a matter of personal interest, as a volunteer, and professionally. He has conducted biological studies, surveys, monitoring, and other related activities on sites in Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Santa Barbara Counties in Southern California. These have included: general biological surveys for wildlife and plants; point counts, vegetation mapping; revegetation and revegetation monitoring; seed collecting; focused sensitive, threatened, and endangered wildlife and plant species surveys; monitoring for sensitive, threatened, and endangered species; sensitive species exclusion and relocation; small mammal trapping studies; and the preparation of documents and reports related to those projects.

Mr. Green is experienced in visually and aurally identifying birds. Over the past twenty years he has spent thousands of hours in the field, both personally and professionally, studying birds in California. He has hundreds more hours of bird observations over most of the United States and in Canada, Costa Rica, Great Britain, Kenya, Madagascar, and Mexico. He has observed, surveyed for, and monitored for many sensitive bird species including the Coastal California Gnatcatcher, Least Bell's Vireo, and Southwestern Willow Flycatcher, Yuma Clapper Rail. He is the Riverside County editor for the journal North American Birds, which reports quarterly on trends in bird populations and occurrences. He has participated in the National Audubon Society's Christmas Bird Count program for many years. For seven years he was the compiler of the Southeastern California Rare Bird Alert. Mr. Green also leads birding field trips for the Audubon Society. He has conducted personal and historical research to compile and maintain a checklist of the birds and other vertebrates of the Box Springs Mountains in western Riverside County.

Employment history

Biologist, AMEC Earth and Environmental 2001-present

President, John F. Green, Incorporated 1979-2001

Detection of Tephritid fruit flies, Supervisor, Department of Agriculture 1991-1996

Assistant (Entomology), University of California, 1991

Presentations / publications

North American Birds, Riverside County editor, Fall 2002-Present.

Birds of the Season, 1998-2005, published quarterly in the Western Meadowlark.

Birds and other Vertebrates of the Box Springs Mountains and Vicinity 1998, updated periodically for the Riverside County Parks Department's Box Springs Reserve.

Ornithological Considerations for Habitat Connectivity. Presentation at the South Coast Missing Linkages Workshop, University of Redlands, Redlands 2002.

Green, John F., David H. Headrick, and Richard D. Goeden 1993. Life History and Description of Immature Stages of Procecidochares stonei Blanc & Foote on Viguiera spp. in Southern California (Diptera: Tephritidae). Pan-Pacific Entomologist 69(1): 18-32.

Representative projects

Least Bell's Vireo Monitoring/Southwestern Willow Flycatcher Monitoring Studies, Santa Ana River, Riverside County. Mr. Green spent the 2002-2008 breeding seasons monitoring a population of the threatened Least Bell's Vireo. This was part of a 13 year monitoring effort for the Riverside County Transportation and Land Management Agency, associated with sand mining around the River Road bridge. This study also included presence/absence surveys for the Southwestern Willow Flycatcher. Data collected has added to evidence of the vireos' positive response to recovery efforts, and of the failure of the flycatcher to benefit from same. Starting in September 2008, a new bridge is being constructed at this site, and Green is project manager of the construction clearance and monitoring team for that project.

Biological Resources Assessments, Southern California Edison, Southern California. Biologist and project manager for numerous Edison projects, ranging from a 73 mile transmission line to a single pole. Project sites primarily in the western county, but have included sites as far east as Blythe. Duties have included project management, biological resources assessments, pre-construction surveys, construction monitoring, preparation of reports and documents, and focused presence-absence surveys for rare plants and various sensitive animal species, including Burrowing Owl, California Spotted Owl, Least Bell's Vireo, Southwestern Willow Flycatcher, and Coastal California Gnatcatcher.

On-Call Biological Services, Caltrans District 11, San Diego and Imperial Counties, CA. Served as one of the biologists on the AMEC team for this on-call, multiple-task biological resources services contract in support of proposed Caltrans projects, including new roadway/highway development, improvements to existing rights-of-way, and other related transportation actions.

Edwards Air Force Base Road Closure Project, San Bernardino, Los Angeles, and Kern Counties, CA. Helped identify unnecessary roads and roads being used for illegal access around the perimeter of the base. Closed roads through a combination of revegetation and vertical mulching (placement of plant and other natural materials).

Banning General Plan, City of Banning, CA. Conducted field visits and helped write the biological section of the new general plan for the City of Banning. This section will guide the city in decisions regarding biological issues associated with changes in land use. During field visits, confirmed records of several sensitive animal species and discovered several unrecorded ones.

Anza Narrows Point Counts, City of Riverside, CA. Points were established in 1996 along the Santa Ana River to monitor yearly progress of bird usage of restored habitat along the Santa Ana River for the Riverside County Regional Parks and Open Space District. Green has been part of the AMEC team conducting these point counts since 2002. Resulting data has documented increased riparian bird usage of the restored habitat over time, particularly by the Least Bell's Vireo.

CFD 88-8 Specific Plan and EIR, Mead Valley, CA. As project manager, conducted and directed a biological assessment and focused Western Burrowing Owl surveys. Wrote report and made recommendations on sensitive species issues on site, including active Burrowing Owl territories.

Bautista Canyon Road Project, Anza, CA. Part of AMEC team. Conducted focused surveys for the Southwestern Willow Flycatcher, Least Bell's Vireo, and Quino Checkerspot Butterfly. Detected willow flycatcher and quino during surveys.

Coachella Canal Lining Project, Coachella Valley Water District, Southern California. Part of AMEC team, that conducted various field studies in Riverside and Imperial Counties for this project. These included identifying all mature trees along the canal right-of-way; seed collection; pre-construction clearance surveys; document preparation, providing on-site biological monitoring to the construction team, and focused presence-absence surveys for sensitive species including the Desert Tortoise, Yuma Clapper Rail, California Black Rail, and Western Burrowing Owl.

Wildlife and Botanical Studies, Proposed San Elijo Lagoon Visitor Center, County of San Diego, Public Works Department, Encinitas, San Diego County, CA. Conducted ornithological assessment as part of AMEC team which produced a biological technical report and constraints analysis of a proposed visitor center adjacent to a coastal lagoon. Biological Resources addressed in the surveys and analysis included Coastal California Gnatcatcher, Least Bell's Vireo, light-footed clapper rail, Belding's Savannah Sparrow, and numerous other salt marsh, riparian, and coastal sage scrub related species.

Riverside County Breeding Bird Atlas. The Breeding Bird Atlas project was an attempt to create a baseline on the status of breeding birds in Riverside County. During this effort, Mr. Green surveyed an area in Riverside County that included much of the Box Springs Mountains and northern Moreno Valley.

Partners in Flight/Birds in the Balance Avian Monitoring. Partners in Flight is a cooperative effort between dozens of government, industry, and environmental entities united to promote bird conservation. One aspect of this effort is the establishment of several regularly scheduled point counts per year on a multi-year basis in numerous locations. The data collected is providing baseline data on bird populations over time. Mr. Green spent several years conducting point counts in Orange County, California for this effort.

Chet McGaugh

Wildlife Biologist/Ornithologist

Professional summary

Mr. McGaugh has studied wildlife in California for 24 years. He specializes in ornithological studies including focused surveys for endangered and sensitive species, population monitoring, breeding and wintering bird surveys, raptor censuses, and life history studies. He conducts inventories of flora and fauna, writes biological assessments, and performs wetlands delineations.

Mr. McGaugh has extensive experience in the visual and auditory identification of birds in North America, and has studied birds in Central and South America, the Caribbean region, Australia, and Europe. Mr. McGaugh is authorized by the United States Fish and Wildlife Service to perform focused surveys for the Federally-designated endangered Least Bell's Vireo and Southwestern Willow Flycatcher, and the threatened California Gnatcatcher. In conjunction with the United States Fish and Wildlife Service and the San Bernardino County Museum, he participated in a four-year life history study of the California Gnatcatcher in western Riverside County from 1992-1995. Since 1996, he has monitored a population of Least Bell's Vireos at the River Road Bridge site in western Riverside County.

Between 1988-1993, Mr. McGaugh collected data as part of an ongoing population monitoring program on the Cleveland, San Bernardino, Angeles, and Los Padres national forests. This effort required point counts at more than 200 locations in the national forests.

In 1997, Mr. McGaugh conducted a comprehensive survey for neotropical migrant birds in Pleasant Canyon in the Panamint Mountains of eastern California.

Mr. McGaugh conducts a yearly breeding bird survey in Joshua Tree National Park for the Department of the Interior, and is the compiler of the Salton Sea-North Christmas Bird Count for the National Audubon Society.

As a permitted bird-bander, Mr. McGaugh has participated in bird-banding projects (including color-banding) for the United States Fish and Wildlife Service, the University of California, Riverside, and the Department of Defense (United States Air Force).

Mr. McGaugh has conducted wetlands delineations for the Riverside County Flood Control and Water Conservation District, the Riverside County Transportation and Land Management Agency, International Technologies Corporation, and VHBC Incorporated.

Mr. McGaugh has served as principal investigator or field assistant for many small mammal trapping surveys.

Mr. McGaugh conducts focused surveys for sensitive reptiles and amphibians, including Desert Tortoise, Arroyo Toad, and Mountain Yellow-legged Frog. He has observed and photographed most of the herpetofauna of Southern California.

Mr. McGaugh surveys for sensitive butterflies, including the Quino Checkerspot, and participates in "Fourth of July Butterfly Counts," sponsored by the North American Butterfly Association. He is a co-compiler of a count in the San Bernardino Mountains.

Mr. McGaugh wrote species accounts for four bird species (American White Pelican, Mountain Plover, Long-billed Curlew, Bank Swallow) for the Bureau of Land Management's West Mojave Plan.

Mr. McGaugh teaches field ornithology classes for the University of California Extension program.

Professional qualifications

California Department of Fish and Game Scientific Collectors Permit #0028

Federal Bird Marking and Salvage Permit #21005-H

Federal Endangered Species Permit for California Gnatcatcher, #TE836517-2

Federal Endangered Species Permit for Southwestern Willow Flycatcher, #TE836517-2

Federal Endangered Species Permit for Least Bell's Vireo, #TE-836517-2

Federal Endangered Species Permit for Quino Checkerspot Butterfly, #TE836517-2

Certificate of Training: Wetland Delineation in Southern California

Education

University Of California, Riverside, B.A. 1973

California State University, San Bernardino, Standard Secondary Teaching Credential, 1975

Location

Riverside, California, USA

Seminars, Workshops, and Symposia

Desert Tortoise Council Symposium, 1990.

U. S. Forest Service Spotted Owl Symposium, Pomona, CA, 1990.

The Wildlife Society California Gnatcatcher Workshop, 1991.

Wetland Delineation Training Workshop, 1991.

California Department of Fish and Game Mojave Ground Squirrel Habitat Techniques Training, Barstow, CA, 1991.

Desert Tortoise Council Techniques Workshop, Ridgecrest, CA, 1993.

"*Empidonax traillii extimus* in California: The Willow Flycatcher Workshop," San Diego Museum of Natural History, 1995.

"The California Gnatcatcher Symposium," University of California at Riverside, 1995.

"Effects of Noise on Passerines," U.S. Navy & Marine Corps Symposium, Hubbs-Sea World Research Institute, 1997.

Warbler Workshop: J.L. Dunn and K.L. Garrett, Glendale, CA, 1997.

"Quino Checkerspot Workshop," Riverside, California, 1998.

"Symposium on Quino Checkerspot Butterfly," Chula Vista, California, 1999.

"Planning for Biodiversity: Bringing Research and Management Together," seminar sponsored by the U.S. Forest Service and the USGS Western Ecological Research Center, 2000.

"Arroyo Toad Symposium (*Bufo californicus*): Natural History and Management Practices," Marine Corps Air Station, Camp Pendleton, California, 2000.

"Ecology and Conservation of the Willow Flycatcher," Arizona State University, Tempe, AZ, 2000.

Memberships

American Ornithologists' Union

Association of Field Ornithologists

Cooper Ornithological Society

Association of Field Ornithologists

Western Field Ornithologists

American Birding Association

Wilson Ornithological Society

Employment history

Wildlife Biologist/Ornithologist, AMEC Earth and Environmental, Inc. November 2000-present. Conducts inventories of fauna and flora, performs literature reviews and research, prepares biological assessment reports and wetland delineations. Specializes in ornithological field studies including breeding bird studies, raptor and shorebird censuses, neotropical migrant surveys, and banding studies. Authorized by U.S. Fish and Wildlife Service to conduct focused surveys for the following Endangered or Threatened species: California Gnatcatcher, Southwestern Willow Flycatcher, Least Bell's Vireo, Quino Checkerspot Butterfly.

Field Experience with the California Gnatcatcher. Since 1988, Mr. McGaugh has performed focused surveys at many sites in western Riverside and San Bernardino counties. In 1990, he conducted focused surveys for California Gnatcatchers for Metropolitan Water District Eastside Reservoir Study. From 1992 to 1995 assisted in a U.S. Fish and Wildlife Service life history study of the California Gnatcatcher in western Riverside County. This study involved nest searches and monitoring, color-banding, and the collection of data for habitat characteristics analysis.

Field Experience with the Least Bell's Vireo and Southwestern Willow Flycatcher. Has performed numerous focused surveys for Least Bell's Vireos and/or Southwestern Willow Flycatchers in Riverside, San Bernardino, and Orange counties, including the monitoring of a population near the River Road Bridge project site along the Santa Ana River near Corona, 1996-2000. In 1996 assisted with a study of nesting Least Bell's Vireo behavior in response to model airplane noise at Hidden Valley Wildlife Area in Riverside.

Field Experience with the Quino Checkerspot Butterfly. In 1998 - 2000 performed focused surveys at several sites in Riverside and San Diego counties.

Wildlife Biologist/Ornithologist, Ogden Environmental and Energy Services, March 2000 - November 2000.

Wildlife Biologist/Ornithologist, Tierra Madre Consultants, Inc., 1988 - March 2000.

Stephen J. Myers

Wildlife Biologist/Ornithologist

Professional summary

Mr. Myers has extensive experience in the visual and auditory field identification of birds. He has spent thousands of hours birding in California, Arizona, Texas, the Pacific Northwest, Costa Rica and Mexico since 1979. Since 1988 he has possessed a federal bird banding permit and has been involved in mist netting and other capture techniques. He is authorized by the USFWS to perform focused surveys for the federally threatened California Gnatcatcher, and recently conducted research on the life history of the California Gnatcatcher, color banding this species in western Riverside County. Mr. Myers is also permitted for the Southwestern Willow Flycatcher and Least Bell's Vireo. He has performed research for the University of California (Riverside), U.S. Forest Service, Los Angeles County Museum of Natural History, and the San Bernardino County Museum. He conducts an annual censusing route for the U.S. Fish and Wildlife Service Breeding Bird Survey and has participated in the Los Angeles, San Bernardino and Riverside County Breeding Bird Atlases since 1987. He has participated in the National Audubon Society Christmas Bird Count for 21 years, serving as compiler for two count locations. Mr. Myers is currently conducting an independent research project on Lark Sparrows (*Chondestes grammacus*) using color marking of birds, and is performing on-going avian monitoring of the Mojave River for a comprehensive paper on the status and distribution of its avifauna. Additional research projects have been published in *Western Birds, Southwest Naturalist* and *Herpetological Review*.

Mr. Myers possesses a Section 10(a) Permit and a Memorandum of Understanding with California Department of Fish and Game to perform focused surveys and trapping for the Stephens' Kangaroo Rat and San Bernardino Kangaroo Rat. He has performed nearly 10,000 trap-nights during small mammal trapping surveys in southern California. He also performs surveys for the Desert Tortoise, Arroyo Toad, Red-legged Frog, Mountain Yellow-legged Frog, Coachella Valley Fringe-toed Lizard, and other herpetofauna.

Mr. Myers also surveys for sensitive butterfly species, and participates in "Fourth of July Butterfly Counts," sponsored by the North American Butterfly Association. He is a co-compiler of a count in the San Bernardino Mountains.

Mr. Myers performs rare plant surveys, including San Bernardino Mountains. "limestone endemics," Santa Ana River Woolly-star, and Slender-horned Spineflower. He prepares restoration and revegetation plans, including a revegetation plan for the 70-mile long Morongo Basin Pipeline Project.

Mr. Myers is a part-time instructor at Victor Valley College in Victorville, California and at the University of California, Riverside Extension, where he teaches ornithology and bird banding classes, respectively.

Professional qualifications

California Department of Fish and Game Scientific Collectors Permit #801040-05

Federal Bird Marking and Salvage Permit #23035

Federal Endangered Species Permit ("10a") for California Gnatcatcher, #TE804203-4

Federal Endangered Species Permit for Southwestern Willow Flycatcher, #TE804203-4

Federal Endangered Species Permit for Least Bell's Vireo, #TE-804203-4

Federal Endangered Species Permit for Stephens' Kangaroo Rat, #TE804203-4

Federal Endangered Species Permit for San Bernardino Kangaroo Rat, #TE804203-4

Federal Endangered Species Permit for Quino Checkerspot Butterfly, #TE804203-4

California Department of Fish and Game MOU for Stephens' Kangaroo Rat, Mohave Ground Squirrel, Least Bell's Vireo, California Gnatcatcher, and Southwestern Willow Flycatcher

Education

Victor Valley College, Victorville, CA (1986-1987)

Mount San Jacinto College, San Jacinto, CA (1974)

California State University, Long Beach, CA (1973)

Location

Riverside, California, USA

Seminars, Workshops, and Symposia

"Seminars in Ornithology," Laboratory of Ornithology, Cornell University, 1983.

"California Gnatcatcher Workshop," The Wildlife Society, 1991.

"*Empidonax traillii extimus* in California: The Willow Flycatcher Workshop," San Diego Museum of Natural History, 1995.

"The California Gnatcatcher Symposium," University of California at Riverside, 1995.

"Effects of Noise on Passerines," U.S. Navy & Marine Corps Symposium, Hubbs-Sea World Research Institute, 1997.

"Quino Checkerspot Workshop," Riverside, California, 1998.

"Symposium on Quino Checkerspot Butterfly," Chula Vista, California, 1999.

"Planning for Biodiversity: Bringing Research and Management Together," seminar sponsored by the U.S. Forest Service and the USGS Western Ecological Research Center, 2000.

"Arroyo Toad Symposium (*Bufo californicus*): Natural History and Management Practices," Marine Corps Air Station, Camp Pendleton, California, 2000.

"Ecology and Conservation of the Willow Flycatcher," Arizona State University, Tempe, AZ, 2000.

Memberships

American Ornithologists' Union

Cooper Ornithological Society

Association of Field Ornithologists

Western Field Ornithologists

Stephen J. Myers

Western Bird Banding Association

American Birding Association

California Native Plant Society

Employment history

Wildlife Biologist/Ornithologist, AMEC Earth and Environmental, Inc. November 2000-present. Conducts field inventories of fauna and flora, performs literature reviews, prepares biological assessment reports emphasizing impact analysis, mitigation measures, and mitigation monitoring. Specializes in ornithological field studies including breeding bird and raptor surveys, and banding studies. Authorized by U.S. Fish and Wildlife Service to conduct focused surveys for the following Endangered or Threatened species: California Gnatcatcher, Southwestern Willow Flycatcher, Quino Checkerspot Butterfly, Stephens' Kangaroo Rat, and San Bernardino Kangaroo Rat.

Field Experience with the California Gnatcatcher. Since 1988, has performed focused surveys at many sites in western Riverside and San Bernardino counties. In 1990, conducted focused surveys for California Gnatcatchers for Metropolitan Water District Eastside Reservoir Study. From 1992 to 1995 assisted in a U.S. Fish and Wildlife Service life history study of the California Gnatcatcher in western Riverside County.

Field Experience with the Least Bell's Vireo and Southwestern Willow Flycatcher. Has performed numerous focused surveys for Least Bell's Vireos and/or Southwestern Willow Flycatchers in Riverside, San Bernardino, and Orange counties, including the River Road Bridge project along the Santa Ana River near Corona, 1996-2002. In 1996 assisted with a study of nesting Least Bell's Vireo behavior in response to model airplane noise at Hidden Valley Wildlife Area in Riverside. In 1999 conducted surveys for Southwestern Willow Flycatcher in several drainages of the Angeles National Forest.

Field Experience with the Quino Checkerspot Butterfly. In 1998 - 2001 performed focused surveys at several sites in Riverside and San Diego counties.

Field Experience with Stephens' and San Bernardino Kangaroo Rats. Has conducted trapping surveys for the Stephens' Kangaroo Rat in western Riverside County Since 1995, and for the San Bernardino Kangaroo Rat in western San Bernardino County since 1998.

Field Experience with the Desert Tortoise. Specialized desert tortoise experience under the authorization of Federal Section 7 Consultation and/or 10(a) permits, and state 2081 permits include: tortoise handling/relocation, burrow excavation and artificial burrow construction for Edwards AFB Leuhman Ridge Rocket Test Site (9/95), Morongo Basin Pipeline (6/93-1/94), and Sempra Line 6905, Kramer-Adelanto Natural Gas PipelIne (10/01-5/02). Additional USFWS and CDFG desert tortoise handling authorization for Caltrans Highway 395 Passing Lane Construction and widening project for Highway 395 (12/98). Performed focused desert tortoise presence/absence surveys for ten projects between 1988 and 1998.

Wildlife Biologist/Ornithologist, Ogden Environmental and Energy Services, March 2000-November 2000.

Wildlife Biologist/Ornithologist, Tierra Madre Consultants, Inc., 1987-March 2000.

Ornithological Field Researcher, University of California, Riverside, Cooperative Extension.

Biological Technician, San Bernardino National Forest, United States Forest Service, 1987-88.

Field Biologist, Los Angeles County Museum of Natural History, 1986-87.

Publications

Myers, S.J. 1993. Mountain Chickadees nest in desert riparian forest. *Western Birds* 24:103-104.

Myers, S.J. 1997. Checklist of the birds of Mojave Narrows Regional Park and the Victor Valley. Mojave Desert Bird Club, Apple Valley, CA.

Myers, S.J. In prep. California Horned Lark (*Eremphila alpestris actia*). Species account for the California Department of Fish and Game's "Bird Species of Special Concern in California."

Myers, S.J. In prep. Vermilion Flycatcher (*Pyrocephalus rubinus*). Species account for the California Department of Fish and Game's "Bird Species of Special Concern in California."

Myers, S.J. and B. Deppe. In prep. Avifauna of the Mojave River, California.

Myers, S.J. and J.D. Edwards. 1994. Checklist of the birds of Silverwood Lake. Mojave River Natural History Assoc., Hesperia, CA.

Patten, M.A. and S.J. Myers. 1992. Geographic distribution: *Bufo microscaphus californicus*. *Herpetol. Review* 23: 122.

Patten, M.A., S.J. Myers, C. McGaugh, and J.R. Easton. 1998. Recovery plan summary: Los Angeles Pocket Mouse (*Perognathus longimembris brevinasus*). Rodentia action plan, Int. Union Conserv. Nature and Nat. Resources.

White, S. D. and S.J. Myers. 1997. Evidence of *Astragalus lentiginosus* var. *borreganus* growing from a heteromyid seed cache. *Southwestern Naturalist* 42:329-330.

Wilcox, M.D., S.J. Myers, K.R. Beaman and R.L. McKernan. 1995. Geographic distribution: *Xantusia h. henshawi*. *Herpetol. Review* 23: 122.

Michael D. Wilcox

Wildlife Biologist / Ecologist

Professional Summary

Specializing in herpetological and entomological studies, Mr. Wilcox has studied California's wildlife in the field for over 15 years. Mr. Wilcox has conducted biological and environmental assessment work throughout Imperial, Inyo, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura counties in California, as well as in the states of Arizona and Nevada. Personal field experience also includes studies of wildlife and ecology in Arizona, Florida, Louisiana, Kansas, Montana, New Mexico, Virginia, Wyoming, the Yucatan (Mexico), Baja California, Belize, Guatemala, Costa Rica, Peru and Bolivia. Professional experience includes serving as the lead biologist, supervising and managing biological compliance monitoring and sensitive species survey efforts for a variety of large-scale projects, as well as conducting focused surveys and monitoring of a variety of endangered, threatened, and/or otherwise sensitive species. In addition to fieldwork, Mr. Wilcox authors environmental and biological assessments, habitat conservation plans, habitat suitability evaluations for sensitive species, mitigation and revegetation plans, and comprehensive field inventories of flora and fauna.

Mr. Wilcox has been authorized by the U.S. Fish and Wildlife Service to perform focused surveys for the federally endangered Delhi Sands Flower-loving Fly, Quino Checkerspot Butterfly, and threatened California Gnatcatcher. Mr. Wilcox has also been authorized to assist other permitted biologists with focused surveys for the Stephens' Kangaroo Rat, San Bernardino Kangaroo Rat, and Mojave Ground Squirrel. He has also received both federal and state agency authorization for specific projects to capture, handle, process, and relocate the Desert Tortoise; and to capture, handle, and release the Mountain Yellow-legged Frog, Panamint Alligator Lizard, and sensitive salamander species. Mr. Wilcox has also received Bureau of Land Management certification for conducting focused surveys for the Flat-tailed Horned Lizard.

Other protected species Mr. Wilcox has worked with include the Arroyo Toad, California Red-legged Frog, Coachella Valley Fringe-toed Lizard, Gila Monster, San Diego Coast Horned Lizard, Belding's Orange-throated Whiptail, Southwestern Pond Turtle, Two-striped Garter Snake, Southern Rubber Boa, Least Bell's Vireo, hibernating bat species, and various sensitive plant species.

Mr. Wilcox also works part-time as an adjunct biology instructor at Victor Valley Community College, teaching Biology 128: "Identification and Study of the Amphibians and Reptiles of the Mojave Desert and Adjacent Mountains" and has served as an assistant instructor for "Jungles and Peaks: Ecology of Belize and Guatemala" and "Natural History of Peru" travel courses. He has also served as a field instructor and technical advisor for several symposia and workshops including the Desert Tortoise Council Survey Techniques Workshop and the Riverside Land Conservancy's Land Stewards School. Additionally, Mr. Wilcox has also participated in the annual U.S. Forest Service Lake Silverwood Winter Bald Eagle Census and several annual Fourth of July San Bernardino Mountains Butterfly Counts sponsored by the North American Butterfly Association.

Professional Qualifications

United States Fish and Wildlife Service Endangered Species Permit (PRT-836491-4) to take the Delhi Sands Flower-loving Fly and Quino Checkerspot Butterfly.

Bureau of Land Management certified Flat-tailed Horned Lizard surveyor # 6840 (CA-067.20).

California Department of Fish and Game Memorandum of Understanding (MOU) authorizing take of the Desert Tortoise (Permitted to capture, handle, and relocate Desert Tortoises for the Southern California Gas Company Kramer Line 6905 Project).

Lead Biologist for California Department of Fish and Game 2081 Incidental Take Permit No. 2081-2001-008-6 authorising incidental take of the Desert Tortoise, Mojave Ground Squirrel, and Burrowing Owl for the Southern California Gas Company Kramer Line 6905 Project.

California Department of Fish and Game Memorandum of Understanding (MOU) authorizing take of the Mountain Yellow-legged Frog (Permitted to capture, handle, and release tadpoles, juvenile, and adult frogs for identification purposes).

California Department of Fish and Game Scientific Collectors Permit # 801024-03, amended to allow the capture of the Panamint Alligator Lizard and salamander species in Pleasant Canyon, Panamint Mountains, CA.

Authorized Individual for various Desert Tortoise studies (Authorized to monitor, handle, process and relocate Desert Tortoises when necessary for specific project implementation).

Authorized Individual for United States Fish and Wildlife Service Endangered Species Permit (TE-804203-5) to conduct activities with the California Gnatcatcher, Southwestern Willow Flycatcher, Stephens' Kangaroo Rat, and San Bernardino Kangaroo Rat (Permitted to conduct focused gnatcatcher and flycatcher surveys, and assist with trapping, handling, and processing for the kangaroo rats under the direct, on-site supervision of Stephen J. Myers).

Authorized Individual for United States Fish and Wildlife Service Endangered Species Permit (PRT-836517-4) to assist with focused surveys of the California Gnatcatcher (Permitted to conduct focused gnatcatcher surveys under the direct, on-site supervision of Chet McGaugh).

Authorized Individual for California Department of Fish and Game Memorandum of Understanding dated April 30, 1997 regarding studies of the Mojave Ground Squirrel (Authorized to trap, handle, and process trapped squirrels).

Authorized Individual for California Department of Fish and Game Memorandum of Understanding dated July 29, 1998 regarding studies of Stephens’ Kangaroo Rat and San Bernardino Kangaroo Rat (Authorized to assist permitted biologist, Stephen J. Myers, with trapping, handling, and processing of trapped specimens).

Education

Bachelor of Arts, University of Redlands, Redlands, 1991

University of California, Riverside, 1994-1995
Relevant extension course work included: Methods of Habitat Restoration and
Ornithology: A Field Study of Birds.

Crafton Hills College, Yucaipa, 1996
Course work included: Psychology.

San Bernardino Valley College, San Bernardino, 1996
Course work included: Child Development

Victor Valley Community College, Victorville, 2000-Present
Course work included: 1) Jungles & Peaks; A Study of the Ecology of Costa Rica (2000), 2) Belize and Guatemala (2003)*, and 3) Natural History of Peru (2006)*. *Served as assistant instructor.

Additional training

Mojave Ground Squirrel Workshop. 4/16-17; Ridgecrest, CA.

Biology of the Rattlesnakes Symposium. 1/15-18/05; Loma Linda University, Loma Linda, CA

28th annual Southern California Botanists Symposium: Rare Plants of Southern California. 10/19/02 California State University, Fullerton, CA

27th Annual Western Field Ornithologists Conference. 10/12/02; Costa Mesa, CA

3rd North American Ornithological Conference. 9/24-28/02; Tulane University, New Orleans, LA

South Coast Missing Linkages Projects: Restoring Connectivity to California's South Coast Ecoregion. 8/07/02; University of Redlands, Redlands, CA

27th Annual Southern California Botanists Symposium: Shifting Sands - Conservation and Biology of California's Dune Habitats. 10/20/01; California State University, Fullerton, CA

Wetland Delineation & Management Training Seminar & Workshop. 2/5-10/01; San Diego, CA

Arroyo Toad Symposium (*Bufo californicus*): Natural History and Management Practices. 10/5/00; Marine Corps Air Station, Camp Pendleton, CA

Planning for Biodiversity: Bringing Research and Management Together. 2/29-3/2/00; Pomona, CA

Workshop on Year 2000 Draft Quino Checkerspot Butterfly Survey Protocol. 11/30/99; Carlsbad, CA

Current Research on Herpetofauna of the Sonoran Desert. 4/9-10/99; Phoenix Zoo, Phoenix, AZ

Status and Biology of the Quino Checkerspot Butterfly. 12/3/98; Carlsbad, CA

Herpetology of the Californias: First Annual Symposia in honor of Lawrence Klauber. 5/15/98; San Diego Natural History Museum, San Diego, CA

Desert Tortoise Council Symposium. 3/94-95,4/98; Las Vegas, Nevada and Tucson, AZ

Declining Amphibians and Reptiles in California II. 3/13/98; San Diego Natural History Museum, San Diego, CA

Quino Checkerpsot Butterfly Seminar. 1/6/98; Temecula, CA

The Quino Checkerspot/Butterfly Identification Workshop. 11/15/97; Riverside Land Conservancy, Riverside, CA

Declining Amphibians and Reptiles in California. 3/14/97; San Diego Natural History Museum, San Deigo, CA

Empidonax trailii extimus in California: The Willow Flycatcher Workshop. 11/95; San Diego, CA

Desert Lands Rehabilitation Workshop. 11/95; Barstow, CA

Desert Tortoise Council Techniques Workshop. 10/93-99; Ridgecrest, CA (Training included survey methods, handling procedures for tortoises and eggs, burrow excavation, and artificial burrow construction)

Biology and Management of Sensitive Amphibians and Reptiles of Central and Southern California. 6/11-12/94; Goleta, CA

Second Annual Horned Lizard Conference. 6/1/94; San Diego, CA

Second Annual Tropical Deciduous Forest Symposium. 5/22-23/94; Tucson, AZ

Memberships

The Wildlife Society– Member: 2005-present

Southwestern Herpetologists Society, Inland Empire Branch – Member: 2001-present, Secretary: 2001-2004

National Audubon Society, Inland Empire Branch – Member: 1999-present

Friends of the University of California, Riverside Entomological Research Museum – Member: 1998-present

California Botanical Society - Member: 1996-present

Riverside Land Conservancy - Land Stewards School Instructor/Technical Advisor: 1995-1997

Society for the Study of Amphibians and Reptiles - Member: 1994-present

Desert Tortoise Council - Member: 1993-present

American Federation of Herpetoculturists - Member: 1988-1995

Inland Empire Reptile and Amphibian Society – Member: 1985-2000, President: 1996-1998, Vice President: 1992-1996, Secretary: 1990-1992

Summary of Core Skills

Experience with Sensitive Amphibian and Reptile Species

Has managed, supervised, and conducted general herpetological inventories, as well as focused field surveys, habitat assessments and/or mitigation monitoring for the following Threatened, Endangered, and sensitive herpetofauna: California Red-legged Frog, Mountain Yellow-legged Frog, Arroyo Toad, Western Spadefoot, Slender Salamanders, Desert Tortoise, Southwestern Pond Turtle, Flat-tailed Horned Lizard, San Diego Coast Horned Lizard, Belding's Orange-throated Whiptail, Coachella Valley Fringe-toed Lizard, Panamint Alligator Lizard, Gila Monster, and Southern Rubber Boa.

Experience with Sensitive Invertebrates

Has managed, supervised, and conducted general entomological inventories, as well as focused field surveys and habitat assessments for the following Threatened, Endangered, and sensitive invertebrates: Delhi Sands Flower-loving Fly, Quino Checkerspot Butterfly, Coachella Valley Jerusalem Cricket, and Mojave Desert Spring Snails. Has also co-authored and participated in Habitat Conservation Plans for the Delhi Sands Flower-loving Fly as well as participated in a life history study of the species.

Experience with Sensitive Bird Species

Has assisted with focused field surveys and conducted habitat assessment and mitigation monitoring for the following Threatened, Endangered, and sensitive avifauna: Bald Eagle, Coastal California Gnatcatcher, Least Bell's Vireo, Southwestern Willow Flycatcher, Le Contes' Thrasher, Burrowing Owl, raptors, and various riparian-nesting bird species. Has assisted permitted biologists with mist netting and color-banding of California Horned Larks for Bird Air-Strike Hazard (BASH) studies and common raven capture, pit-tagging, and release at Edwards Air Force Base. Has also participated in passive relocation and artificial burrow construction for Burrowing Owls.

Field Experience with Sensitive Mammals
Has conducted focused field surveys, habitat assessments and/or mitigation monitoring for the following Threatened, Endangered, and sensitive mammals: Stephens' Kangaroo Rat, San Bernardino Kangaroo Rat, Los Angeles Pocket Mouse, Palm Springs Pocket Mouse, Pacific Pocket Mouse, Mojave Ground Squirrel, Palm Springs Round-tailed Ground Squirrel, and various large carnivores. Has also assisted with live trapping surveys for Stephens' Kangaroo Rat, San Bernardino Kangaroo Rat, Mojave Ground Squirrel, Palm Springs Pocket Mouse, and Los Angeles Pocket Mouse. Has also assisted with focused bat surveys.

Field Experience with Sensitive Plants
Has conducted general botanical inventories, habitat assessments and focused field surveys for the following Threatened, Endangered, and sensitive plant species: Coachella Valley Milk Vetch, Booth's Evening Primrose, and Mojave Monkeyflower. Has also assessed the health, selection of, and supervised the transplantation of Joshua trees, Mojave Yucca, and various species of cacti for various desert restoration projects. Has also participated in the restoration of riparian, wetlands, and coastal sage scrub vegetation communities.

Detailed Core Skills by Project

Renewable Energy Resources
Victorville 2 Hybrid Power Project, ENSR, Victorville, CA. Conducted and prepared comprehensive Biological Resources Assessment Report and Biological Assessment for a 400+ acre hybrid power plant site and associated transmission lines and pipeline easements. Other tasks included overseeing an/or participating in focused Desert Tortoise surveys, focused Burrowing Owl surveys, focused surveys for rare plants, focused trapping surveys for Mojave ground Squirrel, vegetation and sensitive species mapping, identification and delineation of jurisdictional water courses, and identifying potential mitigation strategies. Regulatory agencies involved included California Energy Commission, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and California Department of Fish and Game.

Whitewater Wind Energy Conversion Systems, Shell Oil Corporation, San Gorgonio Pass, Riverside Co., CA. Conducted general and focused (for Desert Tortoise, Burrowing Owl, and sensitive plant species) biological surveys; Desert Tortoise burrow excavation, artificial burrow construction, processing, and relocation; Burrowing Owl burrow excavation, artificial burrow construction, and passive relocation; mitigation monitoring; personnel awareness training for the development, installation, and implementation of a wind energy park located in the San Gorgonio Pass area, on the northwestern outskirts of the Coachella Valley.

Cabazon Wind Energy Conversion Systems, Cannon Power, Cabazon, CA. Conducted general and focused biological surveys (for Desert Tortoise, Burrowing Owl, and Coachella Valley Fringe-toed Lizard), mitigation monitoring, and biological resources awareness training for the development, installation, and implementation of a wind energy park located in the San Gorgonio Pass area for the life of the project.

Domestic Water Development and Supply
Coachella Canal Lining Project, Coachella Valley Water District, Niland, CA. Conducted and prepared detailed assessments of wildlife (specifically Desert Tortoise) accessibility for a 36-mile segment of the Coachella Canal in support of the preparation of FEIS/R, ESA Section 7 Informal

Consultation, NEPA Record of Decision, and CEQA Finding of Fact and Statement of Overriding Considerations and Mitigation Monitoring and Reporting Program processes and document preparation; Imperial and Riverside counties; Coachella Valley Water District, Bureau of Reclamation, and the San Diego Water Authority. Conducted preconstruction and clearance surveys for special-status species (i.e., Desert Tortoise, Burrowing Owl, Flat-tailed Horned Lizard) prior to site disturbance and served as lead biological monitor during the canal construction phase. Other duties included biological awareness training to on site personnel, performing ecological values assessments, preparing mitigation monitoring plan, environmental protection plan, and construction monitoring plan.

Lake Skinner Filtration Plant Expansion Project, Metropolitan Water District, Riverside Co., CA. Conducted general biological surveys, prepared Biological Assessment and authored the Biological Resources Section of an EIR in support of ESA Section 7 Formal Consultation, Section 404 and 1601 permits, NEPA Record of Decision, and CEQA Finding of Fact and Statement of Overriding Considerations and Mitigation Monitoring and Reporting Program processes and document preparation. Significant biological issues included nesting Bald Eagle, California Gnatcatcher, Stephens' Kangaroo Rat, Quino Checkerspot Butterfly, and jurisdictional wetlands and waters of the U.S.

Morongo Basin Pipeline Project, Joshua Basin Water District, Mojave Desert, CA. Conducted general biological surveys, focused surveys for sensitive species (i.e., Desert Tortoise, LeConte's Thrasher, Burrowing Owl), mitigation monitoring, revegetation, conducting biological resources awareness training for a 68-mile pipeline installation project in the Mojave Desert. Significant biological issues included Desert Tortoise, Burrowing Owl, LeConte's Thrasher, and native cacti and yucca.

Mojave River Pipeline, 1994. Conducted focused surveys for the Desert Tortoise from Adelanto to Helendale for the development of the Mojave River Pipeline Project, San Bernardino County, CA

Oil and Gas Development and Supply

Kramer Junction Line 6905 Expansion Project, Southern California Gas Company, Adelanto-Kramer Junction, San Bernardino County, CA. Served as lead biologist, supervising a team of 30+ biologists and biological monitors, for the installation and development of a 33-mile natural gas pipeline project in the Mojave Desert. Conducted general and focused biological surveys (for Desert Tortoise, Burrowing Owl, and sensitive plant species); Desert Tortoise burrow excavation, artificial burrow construction, processing, and relocation; Burrowing Owl burrow excavation, artificial burrow construction, and passive relocation; mitigation monitoring; personnel awareness training, yucca and cacti transplantation, and vertical mulching.

Kinder Morgan Energy Partners On-call Biological Services, Kinder Morgan Energy Partners, Victorville CA to Jean NV. Conducted, managed and supervised others conducting focused preconstruction/clearance surveys and mitigation monitoring for two different multiple product pipeline anomaly repair projects, CalNev 14" and 8", from the vicinity of Victorville, CA north to Jean, NV.

Habitat Conservation Plan for Delhi Sands Flower-loving Fly, SFPP, L.P., Operating Partnership for Kinder Morgan Energy Partners and CalNev Pipeline Company, L.L.C., Colton to Ontario, San Bernardino Co., CA. Developed and co-authored a draft HCP for the Delhi Sands Flower-loving Fly at the Colton Terminal and associated pipeline facilities totalling approximately 50 miles of linear pipeline easements in Colton, Rialto, and Ontario. Managed and conducted focused surveys for the Delhi Sands Flower-loving Fly, general biological assessments, mitigation monitoring, and habitat restoration activities for SFPP, L.P.'s facilities located at the Colton Terminal and within the Colton Dunes.

All American Pipeline Project, All American Pipeline Company, San Bernardino Co., CA. Coordinated and managed general and focused biological surveys and mitigation monitoring for the Desert Tortoise for exploratory geotechnical drilling activities in support of the All American Pipeline Project; San Bernardino County; All American Pipeline Company.

Electrical Power

SCE Habitat Conservation Plan, Southern California Edison Company, Inland Empire, San Bernardino and Riverside Counties, CA. Supervised and managed a team of up to 12 biologists for a two-year period conducting habitat assessments and focused surveys for the Delhi Sands Flower-loving Fly in support of the development of a multi-species HCP for Southern California Edison's transmission line easements and associated properties throughout the Colton Dunes in the Inland Empire.

Otay Mesa Generating Plant, San Diego Gas and Electric Company, Otay Mesa, San Diego County, CA. Conducted habitat assessments and focused surveys for the Quino Checkerspot Butterfly the proposed generation plant site and throughout the associated transmission line easements on Otay Mesa from the U.S./Mexican border north to Chula Vista.

Valley to Auld Electrical Substation and Transmission Line Upgrade Project, Southern California Edison Company, Riverside County, CA. Conducted mitigation monitoring for the Valley to Auld transmission line and electrical substation upgrade project. Significant biological issues included the California Gnatcatcher, Burrowing Owl, Stephens' Kangaroo Rat, Quino Checkerspot Butterfly, Belding's Orange-throated Whiptail, San Diego Coast Horned Lizard, and Southwestern Pond Turtle.

U.S. Forest Service

GST and Level 3 Fiber Optic Installation Project, U.S. Forest Service, San Bernardino Ranger District, San Bernardino Co., CA. Authored a comprehensive Environmental Assessment (EA) and a Biological Assessment/Biological Evaluation (BA/BE) for a joint GST/Level 3 fiber optic conduit installation project throughout a 13-mile segment of the San Bernardino National Forest. Also conducted habitat assessments for the San Bernardino Kangaroo Rat, Quino Checkerspot Butterfly, Least Bell's Vireo, Southwestern Willow Flycatcher and participated in focused surveys for the California gnatcatcher.

Angeles National Forest Arroyo Toad Surveys, U.S. Forest Service, Angeles National Forest Ranger District, Los Angeles County, CA. Conducted habitat assessments and focused surveys for the Arroyo Toad throughout 9 drainage systems containing potentially suitable and in historically occupied habitat within the Angeles National Forest. The focused survey efforts resulted in the detection of the species in one of the drainages surveyed and the discovery of a previously unknown population of the California Red-legged Frog.

San Bernardino National Forest Mountain Yellow-legged Frog Surveys, U.S. Forest Service, San Bernardino Ranger District, San Bernardino County, CA. Conducted habitat assessments and focused surveys for the Mountain Yellow-legged Frog throughout 14 drainage systems in historically occupied habitat within the San Bernardino National Forest resulting in the rediscovery of the species in the San Bernardino Mountains where they had been previously reported to be extirpated.

San Bernardino National Forest Arroyo Toad Surveys, **U.S. Forest Service, San Bernardino Ranger District, San Bernardino County, CA.** Conducted habitat suitability assessments and protocol focused surveys for the endangered arroyo toad in selected drainages, totaling approximately 6 miles, in the San Bernardino National Forest, San Bernardino County, California. Methodologies employed included diurnal and nocturnal eye-shine visual encounter surveys, diurnal larval and egg mass searches, and periodic silent listening for calling individuals. The survey efforts resulted in the detection of arroyo toads within several of the focused survey areas and the rediscovery of the species in the Mojave River.

Department of Defense

Vandenberg Air Force Base Missile Transport Bridge Project. Participated in focused surveys, capture, and relocation of California Red-Legged Frogs and Two-striped Garter Snakes, seine netting and relocation of the Unarmored Three-spine Stickleback, exclusion fence construction and maintenance, construction monitoring, environmental compliance training for the construction of a Missile Transport Bridge over an environmentally sensitive creek, wetlands, and riparian habitat.

Edwards Air Force Base Inventory of Reptiles and Amphibians, Edwards Air Force Base, CA. Participated in a two-year base-wide inventory of the reptiles and amphibians of Edwards Air Force Base. Survey methodologies included diurnal visual encounter surveys, cover boards, night driving, and nocturnal eye-shine searches for amphibians, Edwards Air Force Base.

Camp Pendleton Marine Corps Air Station Road Improvement Project, Kinder Morgan Energy Partners, Camp Pendleton, CA. Provided biological monitoring for the improvement of base road infrastructure. Sensitive biological resources monitored included the Pacific Pocket Mouse and California Gnatcatcher.

March Air Force Base Wetland Mitigation Project, March Air Force Base, Moreno Valley, CA. Designed, implemented, and monitored the development of a wetland (pond 6B') as mitigation for impacts to other on-base wetlands.

Leuhman Ridge Rocket Test Site, Edwards Air Force Base, San Bernardino County, CA. Conducted focused surveys, handling, processing, artificial burrow construction, and relocation of Desert Tortoises at Edwards Air Force Base, San Bernardino County, CA.

Transportation and Infrastructure

CalTrans State Route 138, Segments 10 & 11, CalTrans District 7, Los Angeles County, CA. Coordinated and conducted biological monitoring of the widening of two different, approximate 3-mile sections of State Route 138 in the vicinity of Pearblossom, Los Angeles County, CA. Duties included scheduling monitoring activities, conducting focused preconstruction/clearance surveys for Desert Tortoise and Mojave Ground Squirrel, monitoring, supervision and inspection of exclusion fence installation. Other duties included meeting, communicating, and coordinating with CalTrans inspectors, Granite Construction Company personnel, and revegetation contractors.

Ontario Airport Master Plan, P&D, Ontario, CA. Conducted habitat assessments, mapping, and focused surveys for the Delhi Sands Flower-loving Fly on vacant lands owned and operated by Los Angeles World Airports in support of the Ontario Airport Master Plan, Ontario, San Bernardino County, CA.

CalTrans On-call Biological Services, CalTrans, District 8, Riverside and San Bernardino Counties, CA. Conducted habitat suitability assessments and protocol focused surveys for the Arroyo Toad, Mountain Yellow-legged Frog, California Red-legged Frog, Southern Rubber Boa, and Desert Tortoise for various CalTrans projects throughout portions of Riverside and San Bernardino counties, California. Projects included SR-138 realignment project between I-15 and Summit Valley (Arroyo Toad), I-15 bridge widening project at the Mojave River crossing near Victorville (Arroyo Toad, Red-legged Frog) , SR-18 seismic retrofit at the Mojave River crossing in Apple Valley (Arroyo Toad, Red-legged Frog) , Opah Ditch Mining Reclamation Project near Baker (Desert Tortoise), I-40 widen project between Barstow and Newberry Springs (Desert Tortoise), and Big Bear Dam/SR-18 realignment (Mountain Yellow-legged Frog, Southern Rubber Boa). Methodologies employed included diurnal and nocturnal eye-shine visual encounter surveys, diurnal larval and egg mass searches, periodic silent listening for calling individuals, and linear transects. Sensitive species detected during the course of the contract included the Arroyo Toad, Southwestern Pond Turtle, Desert Tortoise, Silvery Legless Lizard, San Diego Coast Horned Lizard, Belding's Orange-throated Whiptail, and Coastal Western Whiptail.

Bautista Canyon Road Widening Project, Riverside County Transportation Department, Hemet, CA. Supervised, managed, and conducted habitat suitability assessments for sensitive herpetofauna and the Quino Checkerspot Butterfly, conducted a general herpetological inventory, and protocol focused surveys for the Arroyo Toad and Quino Checkerspot Butterfly throughout the suitable areas of the project site, a 13-mile segment of Bautista Canyon Road for a proposed road paving and improvement project. The surveys resulted in the positive detection of the Arroyo Toad and Quino Checkerspot Butterfly throughout various areas of the site.

Parks and Recreation

Arroyo Seco Master Plan General Herpetological Inventory and Focused Sensitive Species Surveys, City of Pasadena Parks & Recreation District, Pasadena, CA. Supervised, managed, and conducted habitat suitability assessments for sensitive herpetofauna, a general herpetogical inventory, and protocol focused surveys for the Arroyo Toad, Mountain Yellow-legged Frog, California Red-legged Frog, Southwestern Pond Turtle and San Diego Coast Horned Lizard within the Arroyo Seco, a tributary of the Los Angeles River, Los Angeles County, California. Methodologies employed included diurnal and nocturnal eye-shine visual encounter surveys, diurnal larval and egg mass searches, periodic silent listening for calling individuals, and night driving. Although the survey efforts for the target species ended with negative results, a total of 14 species including 3 sensitive species (i.e., Coast Range Newt, Coastal Western Whiptail, and Two-striped Garter Snake) have been detected on the project site.

San Bernardino National Forest/California State Park Parcel Exchange Project, The Wildlands Conservancy, San Bernardino National Forest, San Bernardino Co., CA. Conducted comprehensive wildlife surveys and habitat evaluations of several parcels considered for exchange from/to the U.S. Forest Service and California State Parks system.

Private Sector

Rio Vista Specific Plan, Albert A. Webb Associates, Rubidoux, Riverside Co., CA. Conducted, supervised and managed a comprehensive general biological resources assessment, habitat suitability assessments, and follow-up focused surveys for the Delhi Sands Flower-loving Fly, Burrowing Owl, and delineation of jurisdictional areas for the above referenced 909.4-acre project site proposed for residential and commercial development. Documents were submitted in coordination and compliance with U.S. Fish and Wildlife, California Department of Fish and Game, Western Riverside County Multiple Species Habitat Conservation Plan, and the U.S. Army Corps of Engineers.

Desert Dunes Development Project, Terra Nova Planning and Research, Inc., Desert Hot Springs, Riverside Co., CA. Coordinated, managed, and conducted a general biological resources assessment and follow-up focused surveys for Desert Tortoise, Flat-tailed Horned Lizard, Burrowing Owl, Le Conte's Thrasher, Crissal Thrasher, and Coachella Valley Milk Vetch for the proposed residential development of a 450-acre project site located in the Colorado Desert. A delineation and mapping of jurisdictional areas throughout the site was also conducted.

Santa Fe Ranch Biological Resources Inventory and Assessment, Santa Fe Ranch Conservancy, Riverside Co., CA. Conducted, supervised and managed a comprehensive general biological resources assessment, habitat suitability assessments, and follow-up focused trapping surveys for rodents, focused bat surveys, a general wildlife inventory and vegetation mapping for a 2,845.36-acre site.

Religious Center for the Carmelite Sisters of the Most Sacred Heart, Lake Los Angeles, CA. Conducted a general biological assessment, habitat suitability assessments, and follow-up focused surveys for the Desert Tortoise and trapping for the Mojave Ground Squirrel for the proposed development of the above referenced project near Lake Los Angeles, Los Angeles County, CA

World Beater Mine Herptological Inventory, and Focused Sensitive Herptological Species Surveys, World Beater Mine, Panamint Mountains, Inyo Co., CA. Conducted a general herpetological inventory and focused surveys for the Panamint alligator lizard and salamander species throughout Pleasant Canyon in the Panamint Mountains, Inyo County, California. Methods used for the survey included diurnal visual encounter surveys, the use of cover boards, and cover plastic stations. Sensitive species detected during the course of the contract included the Panamint Alligator Lizard and Chuckwalla.

Employment History

Wildlife Biologist / Ecologist– **AMEC Earth & Environmental, Inc.**: December 2000 – present

Prepares habitat conservation plans (HCP), environmental assessments (EA), biological assessments (BA), and focused sensitive species' surveys and habitat assessments for both the public and private sectors. Conducts focused presence/absence surveys for rare and endangered flora and fauna including the Desert Tortoise, Southwestern Pond Turtle, Arroyo Toad, California Red-legged Frog, Mountain Yellow-legged Frog, Western Spadefoot, Coast Horned Lizard, Delhi Sands Flower-loving Fly, Quino Checkerspot Butterfly, California Gnatcatcher, and Southwestern Willow Flycatcher. Participates in habitat restoration projects and mitigation monitoring programs for the California Gnatcatcher, Least Bells' Vireo, Stephens' Kangaroo Rat, Desert Tortoise, Flat-tailed Horned Lizard, and California Red-legged Frog.

Adjunct Faculty– **Victor Valley Community College**: March 2002 – present

Serves as part time, adjunct instructor for Biology 128: Identification and Study of the Amphibians and Reptiles of the Mojave Desert and Adjacent Mountains.

Wildlife Biologist / Ecologist– **Ogden Environmental & Energy Services**: March – December 2000

Prepared HCPs, EAs, BAs, and focused sensitive species' survey reports for a variety of projects for both the public and private sectors. Conducted focused presence/absence surveys for rare and endangered flora and fauna including the Desert Tortoise, Arroyo Toad, Delhi Sands Flower-loving Fly, and Quino Checkerspot Butterfly. Participated in mitigation monitoring programs for the California Gnatcatcher, Least Bells' Vireo, Stephens' Kangaroo Tat, Desert Tortoise, and Flat-tailed Horned Lizard. Assisted permitted biologists with focused surveys for the California gnatcatcher.

Wildlife Biologist - **Tierra Madre Consultants, Inc.**: 1993 – March 2000

Prepared biological and environmental assessments, evaluations, and other documents for both the public and private sectors. Performed focused presence/absence surveys for rare and endangered fauna and flora; including the Desert Tortoise, Southwestern Pond Turtle, Southern Rubber Boa, Flat-tailed Horned Lizard, San Diego Coast Horned Lizard, Orange-throated Whiptail, Coachella Valley Fringe-toed Lizard, Panamint Alligator Lizard, California Red-legged Frog, Mountain Yellow-legged Frog, Arroyo Toad, Western Spadefoot, Mojave Ground Squirrel, Stephens' Kangaroo Rat, San Bernardino Kangaroo Rat, Los Angeles Pocket Mouse, hibernating bats, Burrowing Owl, Delhi Sands Flower-loving Fly, and Quino Checkerspot Butterfly. Assists in the preparation of Habitat Conservation Plans; field studies of the California Gnatcatcher; habitat restoration projects, rare plant surveys; small mammal trapping; and wetland delineations.

Wildlife Biologist - **Thomas Olsen Associates, Inc.**: 1995

Performed focused Delhi Sands Flower-loving Fly presence/absence surveys daily at 15 different locations within the City of Fontana. Also performed mitigation monitoring and behavioral studies of the Delhi Sands Flower-loving Fly for San Bernardino County Medical Center throughout the duration of the species' activity period.

Science Teacher **- Shandin Hills Middle School**: 1993

Long-term substitute science teacher, replacing former instructor mid-term, teaching natural sciences (biology, astronomy, geology, etc.) to approximately 250 eighth grade students. Responsible for creating class/home assignments and projects, examinations, parent conferences, disciplinary actions, grading and a variety of other educational activities.

Presentations/publications

Wilcox, M.D. 2006. *Snakes of Hesperia and Adjacent Areas*. OSHA training provided to the City of Hesperia on 9 August 2006, Hesperia, CA.

Wilcox, M.D. 2006. *Snakes of Cismontane Southern California*. OSHA training provided to the Cities of Norco, Corona, and Riverside on 8 August 2006, Norco, CA.

Van Dam, M., A. Van Dam, and M.D. Wilcox. 2006. **Description of the 3rd Instar Larva and Adult Male of *Megasoma sleeperi*** Hardy (Scarabaeidae: Dynastinae). Coleopterists Bulletin 60(1), p.59-67.

Goodward David M., B. Cummings and M. D. Wilcox. 2005. **Geographic Distribution: *Hemidactylus turcicus* (Mediterranean House Gecko).** Herpetological Reveiw. 36 (2):199.

Wilcox, M.D. 2004. *Reptiles and Amphibians of Kansas*. Lecture presented to the California Turtle and Tortoise Club, San Bernardino Chapter on 15 October 2004.

Wilcox, M.D. 2004. *Herpetofauna of the Mojave Desert and Adjacent Mountains*. Lecture presented to the Mojave Desert Bird Club on 10 June 2004.

Wilcox, M.D. 2003. *Reptiles and Amphibians of Kansas*. Lecture presented to the Southwestern Herpetologists Society, Inland Empire Branch on 1 October 2004.

Wilcox, M.D., D.A. Wilcox, K.R. Beaman, and C. Painter. 1999. **Geographic Distribution: *Tantilla yaquia***. Herpetological Review 31(3), p.187.

White, S.D., A.C. Sanders, and M.D. Wilcox. 1996. **Noteworthy Collections: California**. Madrono 43(2), p. 334-338.

Wilcox, M.D., S.J. Myers, K.R. Beaman, and R. McKernan. 1995. **Geographic Distribution: *Xantusia henshawii*.** Herpetological Review 26(2), p.109.

Wilcox, M.D. (Ill.) 1991. **The ABC's of Geography**. Slofoot Publishing, San Bernardino, California.

APPENDIX 2

RECOMMENDED TIMING & METHODOLOGY FOR SWAINSON'S HAWK SURVEYS

RECOMMENDED TIMING AND METHODOLOGY
FOR SWAINSON'S HAWK NESTING SURVEYS
IN CALIFORNIA'S CENTRAL VALLEY

Swainson's Hawk Technical Advisory Committee
May 31, 2000

This set of survey recommendations was developed by the Swainson's Hawk Technical Advisory Committee (TAC) to maximize the potential for locating nesting Swainson's hawks, and thus reducing the potential for nest failures as a result of project activities/disturbances. The combination of appropriate surveys, risk analysis, and monitoring has been determined to be very effective in reducing the potential for project-induced nest failures. As with most species, when the surveyor is in the right place at the right time, Swainson's hawks may be easy to observe; but some nest sites may be very difficult to locate, and even the most experienced surveyors have missed nests, nesting pairs, mis-identified a hawk in a nest, or believed incorrectly that a nest had failed. There is no substitute for specific Swainson's hawk survey experience and acquiring the correct search image.

METHODOLOGY

Surveys should be conducted in a manner that maximizes the potential to observe the adult Swainson's hawks, as well as the nest/chicks second. To meet the California Department of Fish and Game's (CDFG) recommendations for mitigation and protection of Swainson's hawks, surveys should be conducted for a ½ mile radius around all project activities, and if active nesting is identified within the ½ mile radius, consultation is required. In general, the TAC recommends this approach as well.

Minimum Equipment

Minimum survey equipment includes a high-quality pair of binoculars and a high quality spotting scope. Surveying even the smallest project area will take hours, and poor optics often result in eye-strain and difficulty distinguishing details in vegetation and subject birds. Other equipment includes good maps, GPS units, flagging, and notebooks.

Walking vs Driving

Driving (car or boat) or "windshield surveys" are usually preferred to walking if an adequate roadway is available through or around the project site. While driving, the observer can typically approach much closer to a hawk without causing it to fly. Although it might appear that a flying bird is more visible, they often fly away from the observer using trees as screens; and it is difficult to determine from where a flying bird came. Walking surveys are useful in locating a nest after a nest territory is identified, or when driving is not an option.

Angle and Distance to the Tree

Surveying subject trees from multiple angles will greatly increase the observer's chance of detecting a nest or hawk, especially after trees are fully leafed and when surveying multiple trees in close proximity. When surveying from an access road, survey in both directions. Maintaining a distance of 50 meters to 200 meters from subject trees is optimal for observing perched and flying hawks without greatly reducing the chance of detecting a nest/young: Once a nesting territory is identified, a closer inspection may be required to locate the nest.

Speed

Travel at a speed that allows for a thorough inspection of a potential nest site. Survey speeds should not exceed 5 miles per hour to the greatest extent possible. If the surveyor must travel faster than 5 miles per hour, stop frequently to scan subject trees.

Visual and Aural Ques

Surveys will be focused on both observations and vocalizations. Observations of nests, perched adults, displaying adults, and chicks during the nesting season are all indicators of nesting Swainson's hawks. In addition, vocalizations are extremely helpful in locating nesting territories. Vocal communication between. hawks is frequent during territorial displays; during courtship and mating; through the nesting period as mates notify each other that food is available or that a threat exists; and as older chicks and fledglings beg for food.

Distractions

Minimize distractions while surveying. Although two pairs of eyes may be better than one pair at times, conversation may limit focus. Radios should be off, not only are they distracting, they may cover a hawk's call.

Notes and Species Observed

Take thorough field notes. Detailed notes and maps of the location of observed Swainson's hawk nests are essential for filling gaps in the Natural Diversity Data Base; please report all observed nest sites. Also document the occurrence of nesting great homed owls, red-tailed hawks, red-shouldered hawks and other potentially competitive species. These species will infrequently nest within 100 yards of each other, so the presence of one species will not necessarily exclude another.

TIMING

To meet **the minimum level** of protection for the species, surveys should be completed for **at least** the two survey periods immediately prior to a project's initiation. For example, if a project is scheduled to begin on June 20, you should complete 3 surveys in Period III and 3 surveys in Period V. However, it is always recommended that surveys be completed in Periods II, III and V. **Surveys should not be conducted in Period IV.**

The survey periods are defined by the timing of migration, courtship, and nesting in a "typical" year for the majority of Swainson's hawks from San Joaquin County to Northern Yolo County. Dates should be adjusted in consideration of early and late nesting seasons, and geographic differences (northern nesters tend to nest slightly later, etc). If you are not sure, contact a TAC member or CDFG biologist.

Survey dates **Justification and search image**	**Survey time**	**Number of Surveys**
I. *January-March 20 (recommended optional)*	*All day*	*1*

Prior to Swainson's hawks returning, it may be helpful to survey the project site to determine potential nest locations. Most nests are easily observed from relatively long distances, giving the surveyor the opportunity to identify potential nest sites, as well as becoming familiar with the project area. It also gives the surveyor the opportunity to locate and map competing species nest sites such as great homed owls from February on, and red-tailed hawks from March on. After March 1, surveyors are likely to observe Swainson's hawks staging in traditional nest territories.

II. *March 20 to April 5*	*Sunrise to 1000* *1600 to sunset*	*3*

Most Central Valley Swainson's hawks return by April 1, and immediately begin occupying their traditional nest territories. For those few that do not return by April 1, there are often hawks ("floaters") that act as place-holders in traditional nest sites; they are birds that do not have mates, but temporarily attach themselves to traditional territories and/or one of the site's "owners." Floaters are usually displaced by the territories' owner(s) if the owner returns.

Most trees are leafless and are relatively transparent; it is easy to observe old nests, staging birds, and competing species. The hawks are usually in their territories during the survey hours, but typically soaring and foraging in the mid-day hours. Swainson's hawks may often be observed involved in territorial and courtship displays, and circling the nest territory. Potential nest sites identified by the observation of staging Swainson's hawks will usually be active territories during that season, although the pair may not successfully nest/reproduce that year.

III. *April 5 to April 20*	*Sunrise to 1200* *1630 to Sunset*	***3***

Although trees are much less transparent at this time, 'activity at the nest site increases significantly. Both males and females are actively nest building, visiting their selected site frequently. Territorial and courtship displays are increased, as is copulation. The birds tend to vocalize often, and nest locations are most easily identified. This period may require a great deal of "sit and watch" surveying.

IV. *April 21 to June 10*	*Monitoring known nest sites only* ***Initiating Surveys is not recommended***	

Nests are extremely difficult to locate this time of year, and even the most experienced surveyor will miss them, especially if the previous surveys have not been done. During this phase of nesting, the female Swainson's hawk is in brood position, very low in the nest, laying eggs, incubating, or protecting the newly hatched and vulnerable chicks; her head may or may not be visible. Nests are often well-hidden, built into heavily vegetated sections of trees or in clumps of mistletoe, making them all but invisible. Trees are usually not viewable from all angles, which may make nest observation impossible.

Following the male to the nest may be the only method to locate it, and the male will spend hours away from the nest foraging, soaring, and will generally avoid drawing attention to the nest site. Even if the observer is fortunate enough to see a male returning with food for the female, if the female determines it is not safe she will not call the male in, and he will not approach the nest; this may happen if the observer, or others, are too close to the nest or if other threats, such as rival hawks, are apparent to the female or male.

V. ***June 10 to JuIy 30 (post-fledging)***	***Sunrise to 1200 1600 to sunset***	***3***

Young are active and visible, and relatively safe without parental protection. Both adults make numerous trips to the nest and are often soaring above, or perched near or on the nest tree. The location and construction of the nest may still limit visibility of the nest, young, ‘and adults.

DETERMINING A PROJECT'S POTENTIAL FOR IMPACTING SWAINSON'S HAWKS

LEVEL OF RISK	REPRODUCTIVE SUCCESS (Individuals)	LONGTERM SURVIVABILITY (Population)	NORMAL SITE CHARACTERISTICS (Daily Average)	NEST MONITORING
HIGH	Direct physical contact with the nest tree while the birds are on eggs or protecting young. (Helicopters in close proximity)	Loss of available foraging area. Loss of nest trees.	Little human-created noise, little human use: nest is well away from dwellings, equipment yards, human access areas, etc. *Do not include general cultivation practices in evaluation.*	MORE
	Loss of nest tree after nest building is begun prior to laying eggs.	Loss of potential nest trees.		
	Personnel within 50 yards of nest tree (out of vehicles) for extended periods while birds are on eggs or protecting young that are < 10 days old.	Cumulative: Multi-year, multi-site projects with substantial noise/personnel disturbance.		
	Initiating construction activities (machinery and personnel) within 200 yards of the nest after eggs are laid and before young are > 10 days old.			
	Heavy machinery only working within 50 yards of nest.	Cumulative: Single-season projects with substantial noise/personnel disturbance that is greater than or significantly different from the daily norm.		
	Initiating construction activities within 200 yards of nest before nest building begins or after young > 10 days old.		Substantial human-created noise and occurrence: nest is near roadways, well-used waterways, active airstrips, areas that have high human use. *Do not include general cultivation practices in evaluation.*	
LOW	All project activities (personnel and machinery) greater than 200 yards from nest.	Cumulative: Single-season projects with activities that "blend" well with site's "normal' activities.		LESS

APPENDIX 3

CNDDB REPORT FOR SWAINSON'S HAWK IN LOS ANGELES COUNTY

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G5	**CDFG Status:**	
State:	Threatened	**State:**	S2		

Habitat Associations

General: BREEDS IN GRASSLANDS WITH WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 7 **Map Index:** 02503 **EO Index:** 27302

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen
Element: 1979-05-15
Site: 1979-05-15

Record Last Updated: 2003-08-06

Quad Summary: Alpine Butte (3411768/160B)
County Summary: Los Angeles

Lat/Long: 34.66692º / -117.89701º
UTM: Zone-11 N3836472 E417814
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 07N
Range: 10W
Section: 25 **Qtr:** SW
Meridian: S
Elevation: 2,500 ft

Location: 0.5 MILE SOUTH OF THE JUNCTION OF AVENUE K & 130TH STREET EAST, EAST OF LANCASTER
Location Detail: NEST TREE LOCATED 75 YARDS EAST OFF OF A DIRT ROAD.
Ecological: NEST TREE IS A JOSHUA TREE.
Threat:
General: DFG SWHA #LA001. ONE ADULT OBSERVED AT THE NEST ON 15 MAY 1979; FORAGING OBSERVED IN SEC 25 AND 26.
Owner/Manager: PVT

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status

Federal: None
State: Threatened

NDDB Element Ranks

Global: G5
State: S2

Other Lists

CDFG Status:

Habitat Associations

General: BREEDS IN GRASSLANDS WITH WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 800 **Map Index:** 42305 **EO Index:** 42305

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1999-07-06
Site: 1999-07-06

Record Last Updated: 2000-05-10

Quad Summary: Lancaster East (3411861/161A)

County Summary: Los Angeles

Lat/Long: 34.70507º / -118.03269º
UTM: Zone-11 N3840822 E405426
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area:

Township: 07N
Range: 11W
Section: 10 **Qtr:** XX
Meridian: S
Elevation: 2,400 ft

Location: ALONG AVENUE I, EAST OF 50TH STREET EAST, ANTELOPE VALLEY, 4 MILES EAST OF LANCASTER.

Location Detail: RANCH HOUSE LOCATED DIRECTLY ACROSS THE STREET.

Ecological: NEST TREE IS A LOCUST, SURROUNDED BY AGRICULTURAL FIELDS.

Threat:

General: NEST DISCOVERED ON 5 MAY 1996. 2 ADULTS AND 2 YOUNG OBSERVED AT THE NEST ON 4 JUL 1996. ADULT OBSERVED ON THE NEST ON 6 JUL 1999.

Owner/Manager: UNKNOWN

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status		NDDB Element Ranks		Other Lists	
Federal:	None	**Global:**	G5	**CDFG Status:**	
State:	Threatened	**State:**	S2		

Habitat Associations

General: BREEDS IN GRASSLANDS WITH WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 801 **Map Index:** 42483 **EO Index:** 42483

Dates Last Seen
Element: 1999-06-09
Site: 1999-06-09

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Record Last Updated: 2000-03-02

Quad Summary: Alpine Butte (3411768/160B)

County Summary: Los Angeles

Lat/Long: 34.70473º / -117.91643º
UTM: Zone-11 N3840681 E416073
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 07N
Range: 10W
Section: 14 **Qtr:** XX
Meridian: S
Elevation: 2,440 ft

Location: AVENUE I EAST AT 120TH STREET EAST, ANTELOPE VALLEY, EAST OF PALMDALE

Location Detail:

Ecological: HABITAT CONSISTS OF AGRICULTURAL FIELDS.

Threat:

General: ADULT OBSERVED DISPLAYING AGITATED BEHAVIOR ON 18 MAY 1999, AND AN ADULT OBSERVED NEAR THE SAME AREA ON 9 JUN 1999; NESTING PRESUMED, BUT EXACT NEST TREE LOCATION NOT KNOWN.

Owner/Manager: UNKNOWN

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status

Federal: None
State: Threatened

NDDB Element Ranks

Global: G5
State: S2

Other Lists

CDFG Status:

Habitat Associations

General: BREEDS IN GRASSLANDS WITH WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 803 **Map Index:** 42486 **EO Index:** 42486

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 1999-07-01
Site: 1999-07-01

Record Last Updated: 2000-03-02

Quad Summary: Little Buttes (3411873/187D)

County Summary: Kern, Los Angeles

Lat/Long: 34.81815º / -118.31677º
UTM: Zone-11 N3853667 E379573
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 2/5 mile

Township: 08N
Range: 14W
Section: 01 **Qtr:** XX
Meridian: S
Elevation: 2,400 ft

Location: SOUTH OF AVENUE A, APPROXIMATELY 1.5 MILES WEST OF 90TH STREET WEST, ANTELOPE VALLEY

Location Detail:

Ecological: HABITAT CONSISTS OF OLD, FALLOW AGRICULTURAL FIELDS, OVERGROWN WITH RUDERAL VEGETATION.

Threat:

General: ON 1 JUL 1999, A PAIR OF BIRDS EXHIBITED AGITATION NEAR A PRESUMED NEST TREE, AND ONE BIRD KEPT FLYING INTO A DENSE PORTION OF THE TREE, WHICH APPEARED TO CONTAIN A NEST.

Owner/Manager: UNKNOWN

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status

Federal: None
State: Threatened

NDDB Element Ranks

Global: G5
State: S2

Other Lists

CDFG Status:

Habitat Associations

General: BREEDS IN GRASSLANDS WITH WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 1467 **Map Index:** 62421 **EO Index:** 62458

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown

Dates Last Seen

Element: 2005-06-16
Site: 2005-06-16

Record Last Updated: 2005-08-29

Quad Summary: Redman (3411778/185C)

County Summary: Los Angeles

Lat/Long: 34.75685º / -117.97878º
UTM: Zone-11 N3846516 E410418
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 08N
Range: 10W
Section: 30 **Qtr:** XX
Meridian: S
Elevation: 2,350 ft

Location: NORTH SIDE OF AVENUE E-8, 0.5 MILE WEST OF 90TH STREET EAST, SW OF REDMAN

Location Detail:

Ecological: NEST WAS LOCATED WITHIN A ROW OF NEARLY DEAD TREES ON THE NORTH SIDE OF AVENUE E-8.

Threat: THREATENED BY HUMAN ACTIVITY.

General: ON 16 JUN 2005, 1 ADULT WAS OBSERVED PERCHED ON NEST, WHILE SECOND ADULT PERCHED AND FLEW EXHIBITING DEFENSIVE BEHAVIOR.

Owner/Manager: UNKNOWN

Biological Resources

Special-Status Species (BRTR) Survey Addendum

PALMDALE HYBRID POWER PROJECT

SPECIAL-STATUS SPECIES SURVEYS ADDENDUM

BIOLOGICAL RESOURCES TECHNICAL REPORT
LOS ANGELES COUNTY, CALIFORNIA

Prepared for:
City of Palmdale, California and Inland Energy
Under subcontract to
AECOM Environment
1220 Avenida Acaso
Camarillo, California 93012-8738
Office: (805) 388-3775
Fax: (805) 388-3577

Contact: Ms. Sara Head
sara.head@aecom.com

Prepared by:
AMEC Earth & Environmental, Inc.
3120 Chicago Avenue, Suite 110
Riverside, California 92507
Office: (951) 369-8060
Fax: (951) 369-8035

Principal Investigator:
Matt Amalong, Wildlife Biologist
matt.amalong@amec.com

April 2009
AMEC Project No. 6554000247

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

PALMDALE HYBRID POWER PROJECT
Special-Status Species Surveys Addendum

1.0 INTRODUCTION

AMEC Earth & Environmental, Inc. (AMEC) prepared this Special-Status Species Surveys Addendum to the Biological Resources Technical Report (AMEC 2008) for the development of the proposed Palmdale Hybrid Power Project (PHPP or Project; Figure 1) because transmission line route modifications occurred subsequent to 2008 surveys. This report provides the results of special-status species surveys on the modified transmission line routes. The updated Project location and description can be found in the Biological Assessment (AMEC 2009).

2.0 METHODS

Field surveys included a general biological resource and habitat assessment and inventory in addition to focused surveys for special-status plant species, desert tortoise (*Gopherus agassizii*), and burrowing owl (*Athene cunicularia*). Field surveys were conducted on April 6-7, 2009 by AMEC Biologists Matt Amalong and Zsolt Kahancza, and biological sub-consultants Ted Rado, Steve Ferrand, Jim Boone, and Barrett Scurlock (see Appendix 1 for qualifications).

Surveys for special-status plants, desert tortoise, and burrowing owl followed accepted protocols (CDFG 2000 and CNPS 2001; U.S. Fish and Wildlife Service [FWS] 1992; California Burrowing Owl Consortium [CBOC] 1993 and California Department of Fish and Game [CDFG] 1995). The surveys were conducted concurrently and involved transects spaced no more than 30 feet apart covering 100 percent of all modified transmission line route right-of-ways (ROW) (Figure 2):

1. Segment 1 Poles 93-124: Avenue M-4 from 100th Street to 105th Street; 105th Street from Avenue M-4 to Avenue P; Avenue P from 100th Street to 105th Street
2. Segment 1 Poles 191-199: Lone Oak Road
3. Segment 2 Poles 110-121: final segment into Vincent Substation

Buffer Zone transects for burrowing owls were spaced 100 feet apart out to 500 feet from the edge of the ROW. Zone of Influence (ZOI) transects for desert tortoises were also walked at 100, 300, 500 feet (these three ZOI transects were conducted concurrently with Buffer Zone transects), 1,200, and 2,400 feet. Special-status species in addition to burrowing owl and desert tortoise were sought on all Buffer and ZOI transects. All flora and fauna detected (*e.g.*, through direct observation, vocalizations, presence of scat, tracks, and/or bones) were recorded. Special-status biological resources observed were plotted by using handheld Global Positioning Systems (GPS) equipment and later transferred to a Geographic Information System (GIS) ESRI ArcView 9.1 format.

3.0 RESULTS

Table 1 contains the 2009 survey details.

Table 1. 2009 Survey Details

Date (2009)	Surveyors[1]	Time	Percent Cloud Cover	Wind (mph)	Temp. (˚F)
Apr 06	MA, ZK, TR	07:00-15:00	0	0-10	45-70
Apr 07	MA, JB, SF, ZK, TR, BS	07:00-13:00	0	0-15	50-70

1 Surveyor Initials:
MA = Matt Amalong, Wildlife Biologist, AMEC
JB = Jim Boone, Botanist/Ecologist, Desert Wildlife Consultants, LLC
SF = Steve Ferrand, Wildlife Biologist, Nevada Biological Consulting, LLC
ZK = Zsolt Kahancza, Wildlife Biologist, AMEC
TR = Ted Rado, Wildlife Biologist, Ted Rado Biological Consulting
BS = Barrett Scurlock, Wildlife Biologist, Nevada Biological Consulting, LLC

3.1 Plants

No additional plant species were observed during the 2009 surveys. Appendix 2 includes the scientific and common names for all plant species detected on the Project Site (all survey years).

According to National Oceanic and Atmospheric Association (NOAA) data, mean rainfall totals for the winter season (*i.e.*, December, January, February) in Palmdale from 1971 through 2000 averaged 4.34 inches. A total of 3.90 inches was recorded during the 2008-2009 winter season. Notwithstanding that the timing of precipitation is a critical factor influencing the germination and growth of plants, the 2008-2009 winter precipitation for Palmdale suggests that plant productivity was adequate in Spring 2009 for conducting plant surveys. Observations from our team, which included highly experienced desert botanists and biologists, confirmed that primary production was sufficiently high to search for special-status plants.

3.2 General Wildlife

No additional wildlife species were observed during the 2009 surveys. Appendix 3 includes the scientific and common names for all wildlife species detected on the Project Site (all survey years).

3.3 Special-Status Species

3.3.1 Special-Status Plants

No special-status plants were observed during the 2009 surveys.

3.3.2 Desert Tortoise

No desert tortoise or sign were observed on the ROW or ZOI transects during the 2009 surveys. Completed desert tortoise survey data forms are presented in Appendix 4.

3.3.3 Special-Status Birds

No burrowing owl or sign were observed on the ROW or Buffer Zone transects during the 2009 surveys. Special-status bird species observed during the 2009 surveys include loggerhead shrike (*Lanius ludovicianus*), a California Species of Special Concern (SSC) species. Four bird nests were observed (Table 2, Figure 3).

Table 2. 2009 GPS Coordinates for Special-Status Species and Sign Observed

ID	UTM NAD 83		Description	Nest Site	Height (ft.)
	Easting	Northing			
205	397636	3817067	Passerine nest (inactive)	Golden cholla	4
206	397638	3816729	Passerine nest (1 egg)	Golden cholla	6
207	413168	3834173	Horned Lark nest (4 eggs)	Ground	0
208	414235	3829921	Loggerhead Shrike (1)		
209	414261	3829519	Loggerhead Shrike (3)		
210	413667	3831609	Passerine nest (inactive)	Joshua tree	10

4.0 DISCUSSION

4.1 Special-Status Plants

No special-status plant species were observed during surveys, so no impacts are anticipated. Impacts to plants and trees covered under the Palmdale Native Desert Vegetation Ordinance and California Desert Native Plant Act (*e.g.*, Joshua trees, California junipers, cacti) will be mitigated as described in the PHPP Inventory Report and Site Plan (AMEC 2009) and the PHPP Revegetation Plan (AMEC 2009).

4.2 Desert Tortoise

Based on discussions with Dr. Alice Karl, a well-known desert tortoise expert, there is a low chance that desert tortoises are present along the north-south portion of transmission line Segment 1 and the southeast portion of transmission line Segment 2 (Karl 2008), although no desert tortoises or sign were found during the surveys. The following avoidance and minimization measures are being implemented in portions of the Project Site, including the north-south portion of transmission line Segment 1 and the southeast portion of transmission line Segment 2.

Avoidance and Minimization Measures for the Desert Tortoise

1. A Worker's Environmental Awareness Program (WEAP) will be implemented prior to ground disturbance to educate the construction crew of potential special-status species present on the Project Site and measures to avoid impacts to those species.
2. Construction and maintenance personnel will be required to inspect for desert tortoise under vehicles prior to moving a vehicle. If a desert tortoise is found beneath a vehicle, the vehicle would not be moved until the desert tortoise had

left of its own accord. All desert tortoise observations would be reported immediately to the Designated Biologist.

3. Clearance surveys on the power plant site will be conducted for desert tortoise prior to surface disturbance and following site fencing with desert tortoise exclusion fencing. On the linear facilities and during site fencing, clearance surveys will be conducted for desert tortoise immediately prior to and during surface disturbance. A Biological Monitor will be present at all times to ensure avoidance of special biological resources.
4. The approved Designated Biologist or Alternate Designated Biologist will be on-site during the periods when desert tortoises are expected to be active, to ensure that construction activities are in compliance with these avoidance and minimization measures, and to ensure that any desert tortoises wandering onto the construction site will not be inadvertently harmed.
5. The Designated Biologist will be responsible for: (a) enforcing a litter-control program; (b) ensuring that desert tortoise exclusion fences are maintained where applicable; (c) ensuring that desert tortoise habitat disturbance is restricted to authorized areas; (d) ensuring that all equipment and materials are stored within the boundaries of previously disturbed areas; and (e) ensuring that all vehicles associated with construction activities remain within the proposed construction zones.
6. Project activities that might endanger a desert tortoise will cease if a desert tortoise is found on an active work area. Project activities will resume after the desert tortoise has moved to a safe area on its own. Any such tortoise will be monitored by a Biological Monitor to ensure its safety, including determining if the tortoise has a nearby burrow or is likely to be active in the area. If necessary, temporary fencing will be installed in the active work area, to separate the tortoise from active construction.
7. Any tortoise found on or near the site will be reported immediately to the FWS and CDFG by the Designated Biologist.
8. Upon locating or receiving a report of a dead/injured tortoise on the Project Site, the Designated Biologist will immediately notify the local CDFG and FWS representatives.

Any common raven nesting encountered during construction, operation, or maintenance of the Project will be documented in a periodic report to the appropriate authorities. Common raven nest removal from proposed facilities, if determined to be necessary, would occur in consultation with the FWS and CDFG. The low likelihood of tortoises on the Project Site indicates that a raven control plan is not necessary to protect desert tortoises.

4.3 Migratory Bird Treaty Act and California Fish and Game Code

Special-status bird species most likely to nest within the footprint of the Project Site include burrowing owl, loggerhead shrike, and Le Conte's thrasher. Mitigation measures, including site grubbing prior to the nesting season and nesting bird clearance surveys during the nesting season, with follow-up biological monitoring to ensure nest avoidance, will be implemented to avoid impacts to nesting birds.

To comply with the Migratory Bird Treaty Act and California Fish and Game Code §3503 and 3503.5, any vegetation removal or grading occurring during the nesting season (generally February 1 through August 31) of bird species potentially nesting on the Project will require at least one nesting bird survey (more if deemed necessary) to be conducted by a qualified Biologist. If no nests are found, construction may proceed. If nests are found, impact avoidance measures (*e.g.*, buffers) would be required.

5.0 REFERENCES

AMEC. 2008. PHPP Biological Resources Technical Report. Document prepared for ENSR International in support of the AFC submitted to the CEC.

AMEC. 2009. PHPP Biological Assessment. Document prepared for AECOM Environment in support of the AFC submitted to the CEC.

AMEC. 2009. Palmdale Hybrid Power Project Inventory Report and Site Plan. Document prepared for AECOM Environment in support of the AFC submitted to the CEC.

AMEC. 2009. PHPP Revegetation Plan. Document prepared for AECOM Environment in support of the AFC submitted to the CEC.

California Burrowing Owl Consortium. 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines.

California Department of Fish and Game (CDFG). 1995. Staff report on Burrowing Owl mitigation. CDFG, Sacramento, CA.

CDFG. 2000. Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities.

CDFG. 2008. California Natural Diversity Database (CNDDB), RareFind, Version 3.1.0.

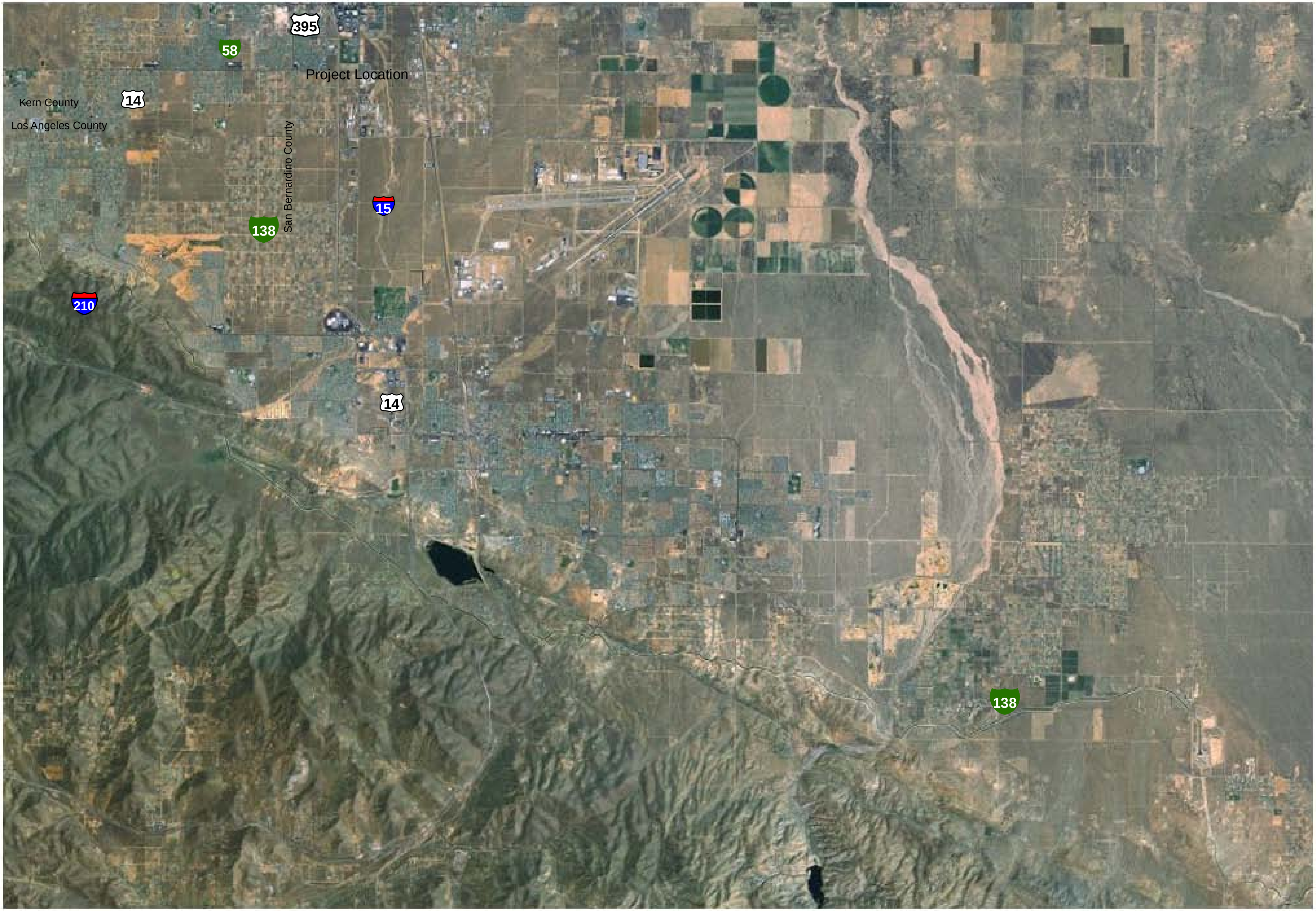
California Native Plant Society (CNPS). 2001. CNPS Botanical Survey Guidelines.

CNPS. 2008. Inventory of Rare and Endangered Plants (online edition, v7-08c). California Native Plant Society. Sacramento, CA.

Karl, A. 2008. Personal communication with AMEC Wildlife Biologist Matt Amalong.

United States Fish and Wildlife Service (FWS). 1992. Field survey protocol for any federal action (or non-federal action) that may occur within the range of the Desert Tortoise. Regions, 1, 2, and 6 of the Fish and Wildlife Service. October 1992. 18 pp. plus appendices.

FIGURES



Legend

Power Plant Site Survey Area
Transmission Line
Potable Water
Sanitary Wastewater Pipeline
Natural Gas Pipeline
New 2009 Survey Areas
Reclaimed Water Pipeline

Palmdale Hybrid Power Project

Figure 1

Vicinity & Location

0 1 2 3 4 Miles

1:125,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 04/28/09

N

Legend

Survey area

Transmission Line 100

Resurveyed Routes 500

1200

2400

Palmdale Hybrid Power Project

Figure 2.A.1

PHPP 2009 Survey Areas

0 1,400 2,800 Feet

1:24,000

Map Notes:

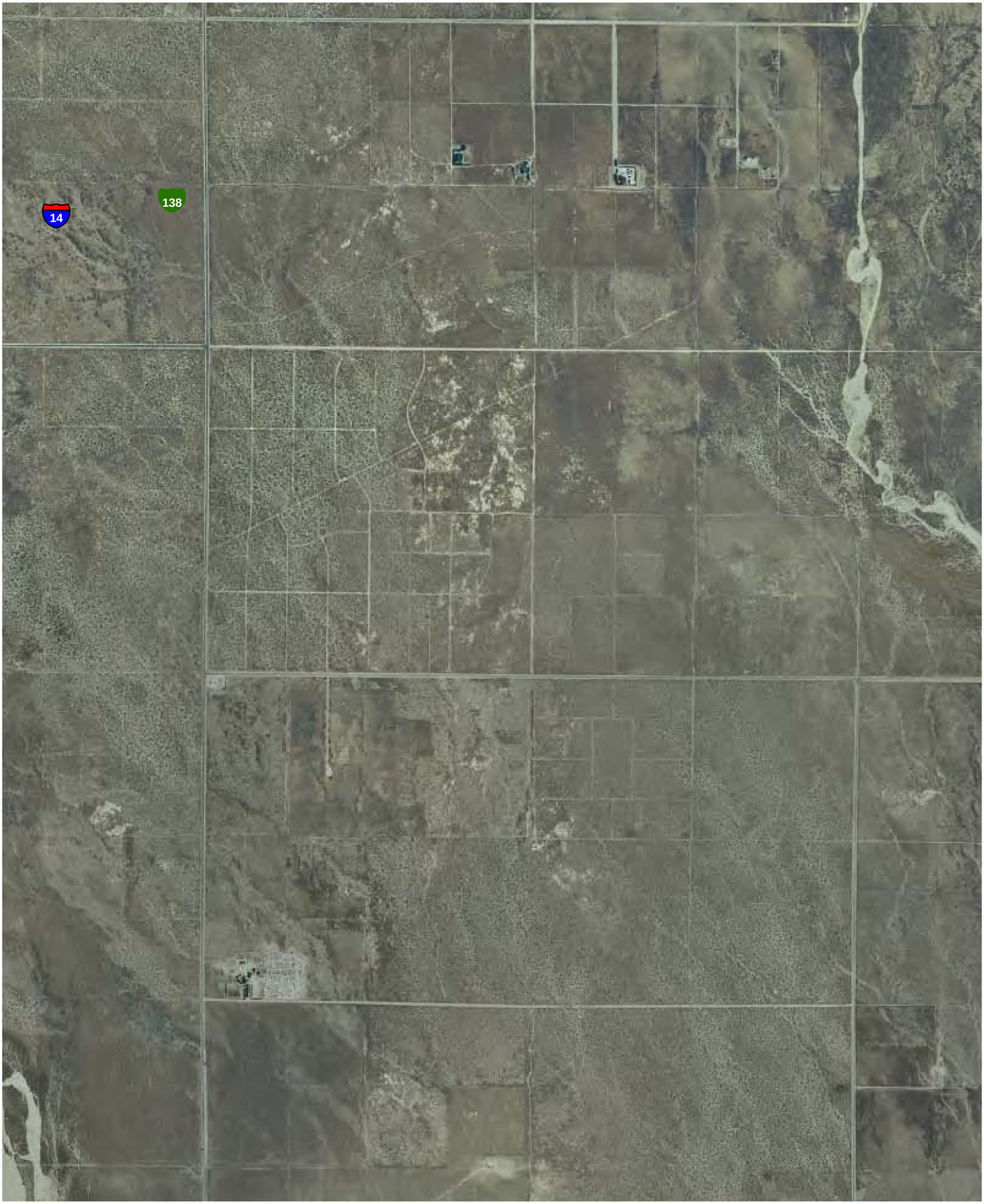
Projection: NAD 83, Zone 11

Path:S:\active projects\Palmdale

Power Plant Bio 6554000247\graphics\mxd\2009

Date: 04/16/09

N



Legend

Transmission Line
Resurveyed Routes

Survey area
100
500
1200
2400

Palmdale Hybrid Power Project

Figure 2.A.2
PHPP 2009 Survey Areas

0 1,400 2,800 Feet

1:24,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 04/16/09

N

Legend

Transmission Line

Resurveyed Routes

Survey area

100

500

1200

2400

Palmdale Hybrid Power Project

Figure 2.B

PHPP 2009 Survey Areas

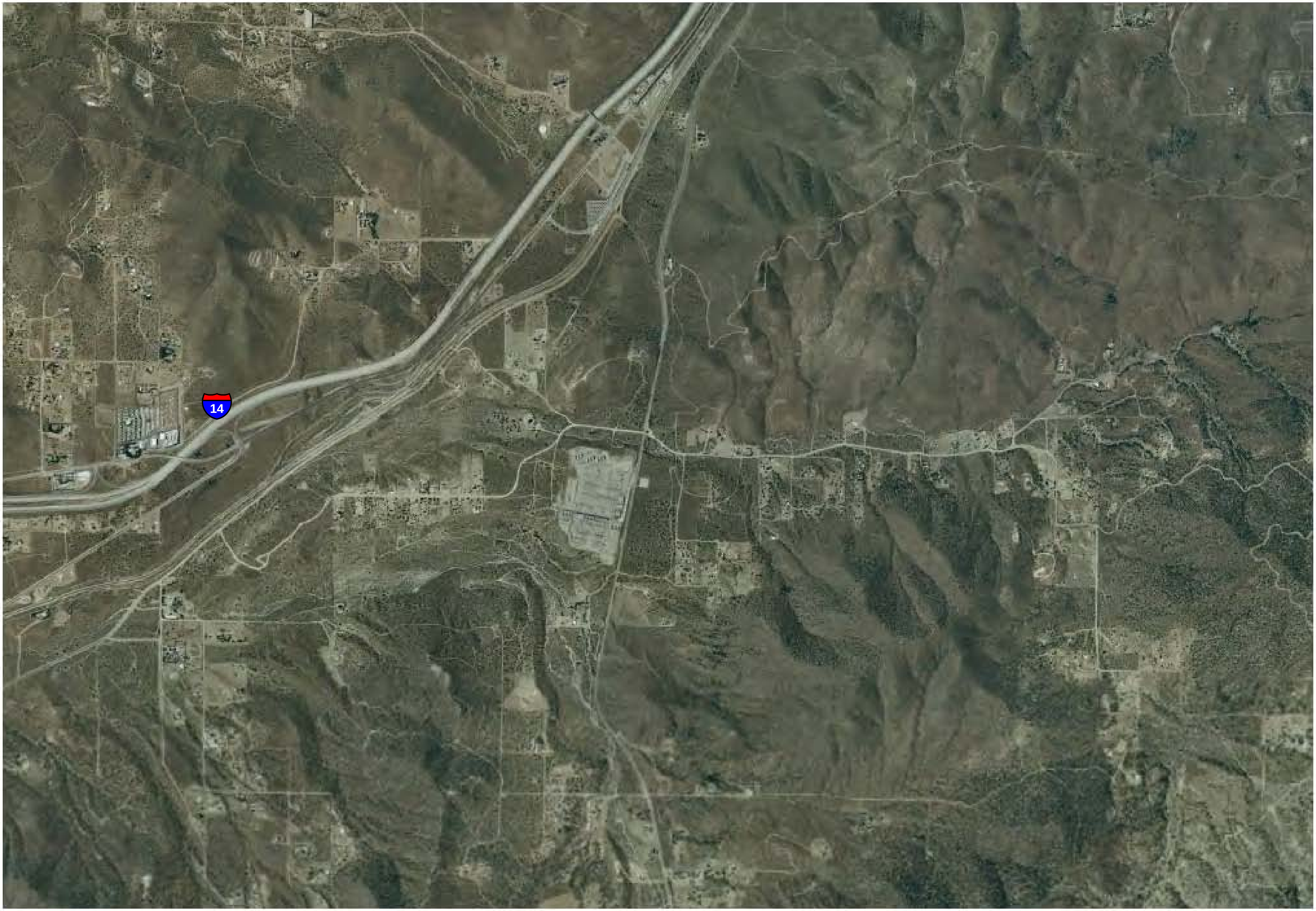
0 2,100 4,200 Feet

1:24,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 04/16/09

N



Legend

	Survey area
Transmission Line	100
Resurveyed Routes	500
	1200
	2400

Palmdale Hybrid Power Project

Figure 2.C

PHPP 2009 Survey Areas

0 2,250 4,500 Feet

1:24,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 04/16/09

N

Legend

Transmission Line

Palmdale Hybrid Power Project

Figure 3.A

PHPP Special-Status Species & Sign Observed

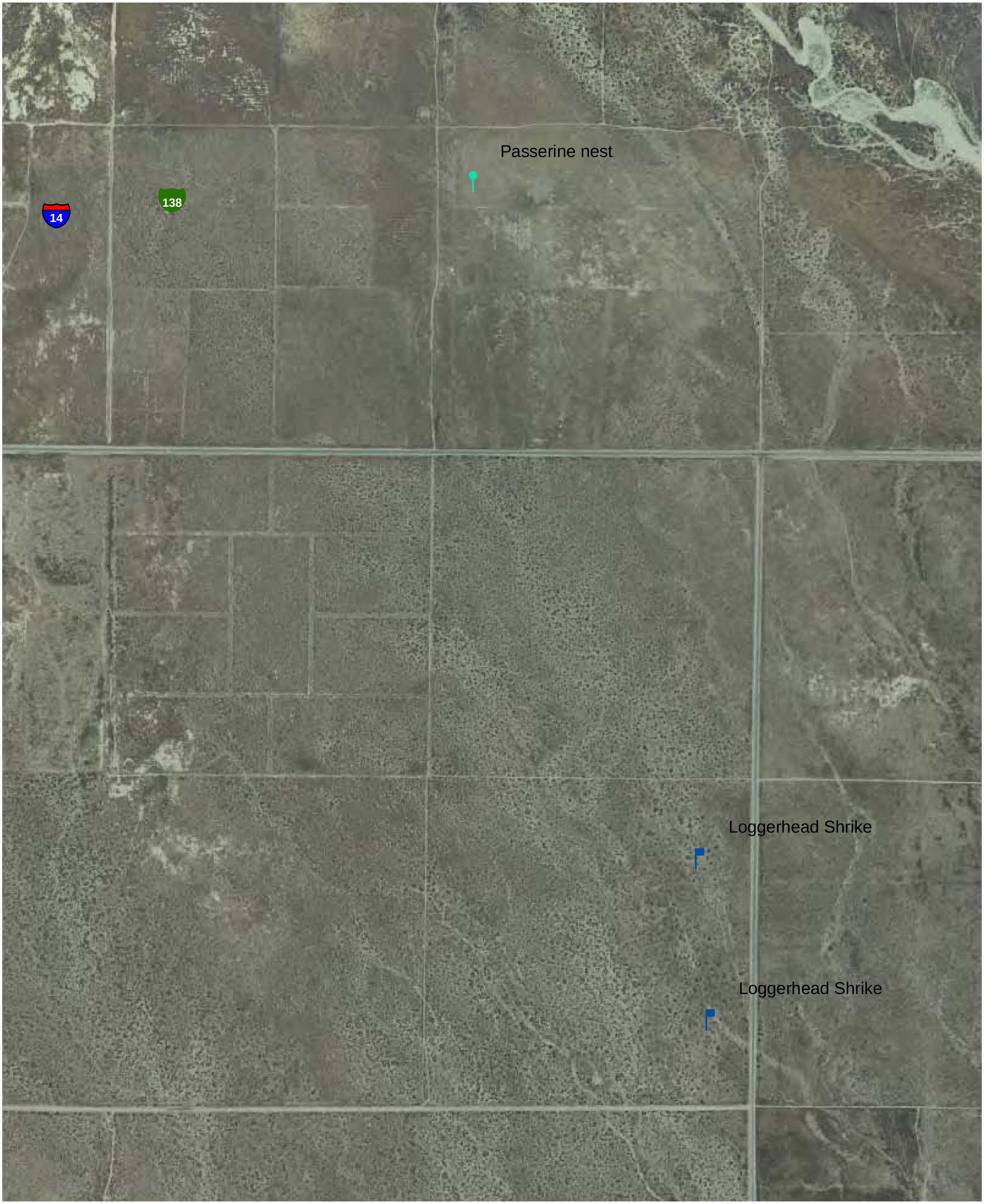
0 620 1,240 Feet

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 04/16/09

N



Legend

Transmission Line

Palmdale Hybrid Power Project

Figure 3.B
PHPP Special-Status Species & Sign Observed

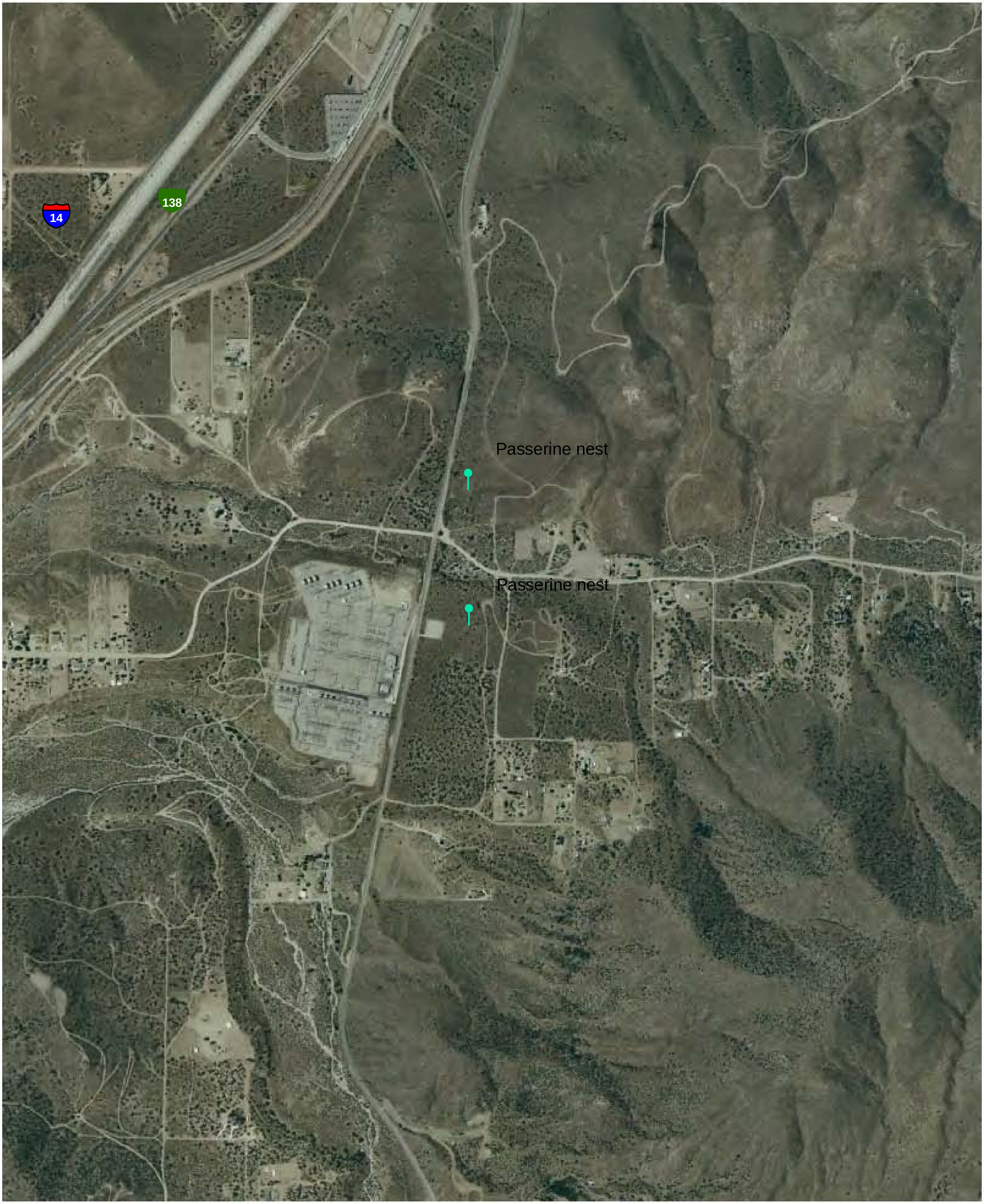
0 620 1,240 Feet

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale Power Plant Bio 6554000247\graphics\mxd\2009
Date: 04/16/09

N



Legend

Transmission Line

Palmdale Hybrid Power Project

Figure 3.C

PHPP Special-Status Species & Sign Observed

0 620 1,240 Feet

1:12,000

Map Notes:

Projection: NAD 83, Zone 11
Path:S:\active projects\Palmdale
Power Plant Bio 6554000247\graphics\mxd\2009
Date: 04/16/09

N

APPENDIX 1

QUALIFICATIONS OF INDIVIDUALS CONDUCTING STUDIES

Matt Amalong

Wildlife Biologist

Professional summary

Eight years experience as an environmental consultant/biologist. Responsibilities have included: project management; preparation of FERC, BRAR, BRTR, EA, EIR, CIA, AFC and CEQA Biological Resource Reports; preparation of scopes, schedules, and budgets; desktop surveys (CNDDB, internet, literature search, etc.); technical editing and report writing; proposed wind energy facilities surveys (avian, wildlife, plant); monitoring of endangered species (California least tern & western snowy plover); wetland delineation projects; restoration projects; wind energy projects; superfund site projects; coordinating and conducting field surveys (avian, herpetological, mammalian, vegetation); and construction monitoring.

Professional qualifications

Basic Wetland Delineation, Wetland Training Institute, Aug 2007

Desert Tortoise Surveying, Monitoring, and Handling Techniques Workshop, Nov 2006

Avian/Bat Fatality Survey Training, Searcher Efficiency, and Carcass Removal Trials at Wind Farms, Aug 2006

Flat-tailed Horned Lizard Survey Certification, Jun 2006

Successful CEQA Compliance Workshop, Feb 2006

40-Hour HAZWOPER Training, Dec 2005

8-Hour HAZWOPER Refresher, Nov 2006

CDFG Scientific Collecting Permit

Education

Graduate School, Biology/Ornithology, California State University, Long Beach, 2000-2003

B.S., Biology, Stetson University, 1999

Memberships

The Wildlife Society, Western Section

National Wind Coordinating Collaborative

The Desert Tortoise Council

Languages

English

Summary of core skills

As Project Manager, responsible for scope, schedule, budget, and level of quality for a variety of projects.

Detailed core skills or details by project

Oak Creek Energy Systems Inc., Wind Assessment Projects, southern CA and southern NV. Coordinated cultural and biological field surveys for three-year renewable wind prospecting BLM right-of-way grants for the installation of meteorological towers at five project sites in southern CA (San Bernardino and Kern Counties) and southern NV (Clark County). Prepared Biological Resource Assessment Reports to support EA documents.

Energy Unlimited Inc., Revised Commercial WECS 20 Permit Project, Riverside County, CA. Provided biological support and prepared DEIR Response to Comments for a Repower Project in Desert Hot Springs, CA. The proposed Project will install eight new GE 1.5 MW wind turbine generators, remove sixteen existing smaller Bonus 65 kW wind turbine generators, construct a single-story storage building, and expand an existing outdoor storage area within the existing WECS 20 Wind Park.

RES Energy, Granite Mountain Wind Project, San Bernardino County, CA. Prepared biological study plan. Coordinated and conducted bi-weekly avian point-count surveys for proposed 46 MW Granite Mountain Wind Project in San Bernardino County. Analyzed avian point-count data and prepared mean use report providing results of those surveys. Identified species at risk by visual and aural observations. RES proposes to develop a new wind energy generation facility. This facility will include access roads, underground electrical lines, underground communication lines, concrete wind turbine foundations, tubular steel towers, 2.3-megawatt wind turbines, transformers, a communications system, and undisturbed open space. Project work required for preparation of an EIR for submission to the Bureau of Land Management (Barstow Field Office).

Dillon Wind, LLC, Field Surveys and EIR, Riverside County, CA. Coordinated and conducted field surveys for special-status species, including desert tortoise, flat-tailed horned lizard, and burrowing owl. Wrote General Biological Assessment for County of Riverside and Biological Resources Technical Appendix for EIR. Dillon Wind, LLC is proposing to construct and operate an approximately 45 megawatt (MW) wind energy conversion system (WECS) project in the San Gorgonio Pass area of Riverside County. The Project will involve the installation of supporting facilities including on-site access roads, pad mount transformers, underground electrical transmission, and communication lines.

Edwards Air Force Base, Common Raven Study, Lancaster, CA. Developed and implemented a monitoring program to provide information on the population and behavior of ravens and their interaction with desert tortoise within the Desert Tortoise Critical Habitat Area (DTCHA) on Edwards Air Force Base (EAFB). Factors investigated included raven population densities, movement patterns, and diet characteristics. These three primary factors were evaluated both inside and outside the boundaries of the DTCHA and EAFB. Additional information collected included raven nesting locations and staging areas. The study was also intended to establish point count locations where long-term comparative data can be collected to measure the status and impact of raven populations within and adjacent to the DTCHA. Wrote biological report for Army Corps of Engineers.

PPM Energy, Tule Wind Project, San Diego County, CA. Prepared biological study plan. Coordinated and conducted bi-weekly avian point-count surveys, surveys for rare plant species, and surveys for refining vegetation community maps for proposed 177 MW Tule Wind Project in eastern San Diego County. Identified species at risk by visual and aural observations. The primary components of the proposed project are approximately 118 1.5-MW capacity wind turbines with a hub height of approximately 80 meters, a rotor diameter of 77 meters, and a total height of approximately 118 meters. Electrical power generated by the wind turbines would be collected on-site by underground 34.5kV transmission lines and ultimately delivered to an existing substation in Boulevard, approximately 3 mi. south of the project site via an overhead 230kV transmission line. Project work is required for preparation of an EIR.

FPL Energy, LLC, Beverly and DeKalb & Lee Wind Resource Areas, IL. Wrote Environmental Critical Issues Analysis (CIA) Report for two proposed wind energy conversion facilities in Beverly and DeKalb & Lee Counties, Illinois. These reports evaluated current environmental conditions and potential impacts on sensitive biological and cultural resources within the Wind Resource Areas (WRA). It also evaluated applicable land uses, zoning, and identified the types of permits, plans, and approvals that would likely be required for project development. Current plans for the Beverly WRA include the installation of 126 tubular-steel, 80 meter tall, 1.5 megawatt (MW) GE turbines (approximately 190 MW). Current plans for the DeKalb & Lee WRA include the installation of 129 tubular-steel, 80 meter tall, 1.5 megawatt (MW) GE turbines (approximately 194 MW). Infrastructure to be constructed or installed in conjunction with the turbine arrays and associated substations include access routes and both buried and overhead transmission lines.

Salton Sea Authority, New & Alamo River Wetland Restoration Plan, Imperial County, CA. Coordinated and implemented reconnaissance-level habitat and biota surveys along the New and Alamo Rivers in Imperial County, CA. The primary goal of the proposed surveys were to identify those flora and fauna that are currently present at the undeveloped sites and to help predict those species that may be present in any future wetlands scenario. Wrote biological report for Tetra Tech Divisions to be incorporated as a chapter in the Master Plan for New and Alamo Rivers.

UPC Wind Energy, LLC, Mile High Ranch Wind Project, Hudspeth County, TX. Analyzed avian point-count data and prepared mean use report providing results of those surveys for proposed wind energy conversion facility on an approximately 44.5 km^2 (11,000 acre) area of west-central Texas, approximately 50 km east of El Paso near the El Paso/Hudspeth County line. The proposed design includes GE 1.5 MW turbines, which have an 80-meter hub height and a rotor diameter of 77 meters, resulting in a rotor swept area (RSA) between 41.5 and 118.5 meters above ground level. Infrastructure to be constructed or installed in conjunction with the turbine array and associated substation includes access routes and transmission lines. The protocol for this analysis was similar to protocols used at the Condon, Maiden, Stateline, and Vansycle wind projects in Oregon and Washington, the Buffalo Ridge wind project in southwest Minnesota, and the Foote Creek Rim wind project in Wyoming.

Luke Air Force Base, Barry Goldwater Tactical Range, Nevada. Coordinated and conducted biological surveys for Sonoran pronghorn antelope. Utilized video camera surveillance to monitor wildlife activity at watering/revegetation plots. Included installation of cameras and DVR equipment.

All-American Canal Lining Project, Imperial County, CA. Prepared training and safety materials, including Worker's Environmental Education Program (WEEP) manual, special-status species identification cards, environmental signs, training documentation database, and stickers. The purpose of the AAC Lining Project is to conserve seepage lost from the unlined AAC. The conserved water is needed in the southern California coastal area to offset a projected water shortage of 1.2 million acre-feet that is expected by the year 2010. The proposed project has the potential to conserve about 67,700 acre-feet per year.

North Baja Expansion Project, Imperial and Riverside County, CA. Prepared FERC Resource Report: Vegetation and Wildlife. The purpose of this report was to describe the existing fish, wildlife, and vegetation resources that would be affected directly and indirectly by the proposed North Baja Expansion (NBX) Project and to assess the potential impacts to these resources resulting from construction and operation of the proposed project. The report also identifies the mitigation measures that are proposed to reduce the impact to these resources. The proposed project consists of the following two components: the B-line, which is comprised of the North Baja Loop, the Blythe Lateral, and the SoCal Gas Lateral; and, the IID Lateral.

Sempra Energy Resources, Imperial Valley Desert Restoration Project. Compiled and edited the “As-built” baseline surveys and initial execution of Sempra’s restoration plan, including tamarisk, a non-native invasive shrub/small tree, removal and off-site mitigation for impacts.

North Baja Pipeline Extension, Avian Surveys, AZ and CA. Compiled and edited focused avian survey reports for southwestern willow flycatcher and clapper rail.

South Coast Water District, Laguna Sur Sanitary Easement Natural Resources Evaluation, Orange County, CA. Compiled and edited an assessment intended to determine potential environmental regulatory and compliance issues associated with regular and emergency maintenance activities needed to maintain operation of SCWD facilities within the Laguna Sur Sanitary Easement.

South Coast Water District, Casden Properties, LLC, Los Angeles County, CA. Compiled and edited focused avian survey reports for California gnatcatcher and burrowing owl. Complied with California Environmental Quality Act (CEQA), state and federal Endangered Species Acts (ESA), Clean Water Act (CWA), California Department of Fish and Game (CDFG) Code Sections, and Migratory Bird Treaty Act (MBTA) associated with emergency maintenance activity requisite to maintain use and operation of SCWD facilities.

Department of the Navy, Superfund Site, Hunters Point, CA. Monitored biological resources on former Hunters Point Naval Shipyard superfund cleanup site. Maintained buffer zones to protect biological resources; prepared and filed daily field monitoring reports; interacted with construction staff to ensure compliance with established environmental protection measures.

Rialto Municipal Airport, Phase I Environmental Site Assessments, Rialto, CA. Compiled and edited Phase I Environmental Site Assessments for four properties in and around the Rialto Municipal Airport.

Pacific Gas and Electric, North Baja Natural Gas Pipeline, California and Arizona. Field compliance with NEPA, CEQA, FERC, and federal and state Endangered Species Acts for an 80-mile natural gas line extending from Ehrenberg, La Paz County, Arizona, through Riverside and Imperial Counties, California to an interconnection with Sempra International's proposed Gasoducto Bajanorte pipeline at the U.S./Mexico border west of Yuma, Arizona. Implemented field compliance with terms and conditions of formal consultation with the USFWS pursuant to Section 7 of the Endangered Species Act of 1973 (as amended) and CDFG 2081 Take Permit. Field executed desert restoration plan, field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Assisted with threatened and endangered species surveys for rare plants, desert tortoise, flat-tailed horned lizard, burrowing owl, Gila wood pecker, southwestern willow flycatcher, and nesting bird surveys in accordance with the MBTA. Additional responsibilities included instructing, implementing, and maintaining compliance with various mitigation measures outlined in numerous project approvals and permits.

Port of Los Angeles, Pier 400 California Least Tern Nesting Site, Los Angeles County, CA. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Monitored breeding biology of California least tern. Observed and monitored other sensitive species such as western snowy plover, burrowing owl, black skimmer, Caspian tern. Assisted with predator management (trapping and relocating) of peregrine falcon, American kestrel, burrowing owl, feral cats, corvids, gulls. Conducted banding studies on least, Caspian, and elegant terns. Compiled and analyzed data into annual reports.

City of Murrieta/USFWS, Southern California. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Monitored construction during Clinton Keith Roadway Ramp Interim Improvement Project in habitats containing the endangered California gnatcatcher. Interacted with construction crews to ensure environmental compliance.

Army Corps of Engineers, Southern California. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Conducted California least tern foraging surveys at the Port of Los Angeles and Camp Pendleton. Monitored snowy plover activity adjacent to CLT nesting sites. Compiled and analyzed data in an annual foraging report.

Upper Newport Bay, Orange County, CA. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Conducted avian surveys at Big Canyon and West Bay. Monitored endangered California gnatcatcher. Compiled avian, mammalian, herpetological, and entomological species lists.

Myra Frank, Southern California. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Monitored construction during I-5 highway construction in habitats containing endangered species (Willow Flycatcher, Least Bell's Vireo, Unarmored 3-spined Stickleback). Interacted with CalTrans and construction crews to ensure environmental compliance.

Alameda Corridor, Los Angeles County, CA. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Located and marked nests, monitored breeding biology, interacted with construction crews during railroad construction to minimize disturbance to nests. Prepared annual breeding report.

Cajalco Creek Dam and Detention Basin, Riverside County, CA. Maintained compliance with various mitigation measures outlined in numerous project approvals and permits. Field compliance included field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Monitored construction in habitats containing endangered species (California gnatcatcher, Stephens' kangaroo rat). Ensured construction crews were in compliance with environmental permits. Prepared annual report.

Batiquitos Lagoon, Carlsbad, CA. Managed four endangered California least tern and western snowy plover nesting sites. Coordinated and communicated with predator management, CDFG, and others to optimize reproductive success. Prepared annual breeding report.

Employment history

Apr 2007 – present Wildlife Biologist, AMEC Earth & Environmental, Inc., Anaheim, CA

Aug 2005 – Apr 2007 Associate Biologist, Tetra Tech EC, Inc., Santa Ana, CA. Project Manager responsible for preparing and executing biological study plans.

Apr 2000 – Aug 2006 Project Biologist, Keane Biological Consulting, Long Beach, CA. Project Manager responsible for coordinating biological surveys and maintaining compliance with mitigation measures.

Jan 2005 – Aug 2005 Assistant Biologist, LSA Associates, Inc., Irvine, CA. Conducted biological monitoring in habitats containing endangered, threatened, and/or species of special concern.

Apr 2004 – Nov 2004 Biological Monitor, CA Department of Fish and Game, Carlsbad, CA. Managed four California least tern and western snowy plover nesting sites.

James L. Boone
Desert Wildlife Consultants, LLC
3112 Ivory Coast Drive, Las Vegas, NV 89117-2346
(702) 286-6477; email: jlboone@aol.com

WORK SUMMARY

I have been involved in basic and applied environmental research since 1975, and in 1995 I earned a Ph.D. in ecology. My experience includes planning and conducting plant and wildlife field surveys, designing experiments, collecting data, performing advanced statistical and computational procedures using a variety of computer programs and platforms, database management, and preparing technical reports and scientific publications. More recently, I made a living as a technical writer in science and engineering. During that time, I remained active in studying the flora, fauna, and geology of the Mojave Desert, and I maintain a website (birdandhike.com) about the Mojave Desert. I also started an environmental consulting firm focused on monitoring desert tortoise activity on construction sites. In the old days, I worked in wildland fire fighting, law enforcement, search and rescue, and emergency medicine.

EDUCATION

Ph.D., ECOLOGY, 1995. University of Georgia, Athens.
Population genetics, systematics, conservation, ecology, applied mathematics.
Dissertation: *Patterns of Temporal and Geographic Variation in the Genetics and Morphology of Cotton Mice (*Peromyscus gossypinus*)*.

M.S., FOREST RESOURCES, 1990. University of Georgia, Athens.
Population genetics, conservation, wildlife management, land use planning.
Thesis: *Reassessment of the Taxonomic Status of the Cotton Mouse (*Peromyscus gossypinus anastasae*) on Cumberland Island, Georgia, and the Implications of this Information for Conservation*.

B.S., WILDLIFE MANAGEMENT, 1986. Humboldt State University, Arcata, CA.
Wildlife management, biostatistics, botany, computers. Graduated summa cum laude.
Senior Thesis: *Morphological Differences between Populations of Deer Mice (*Peromyscus maniculatus rubidus*) in Sand Dune and Upland Habitats*.

PRIMARY RESEARCH PROJECTS

* Response of Mojave Desert vegetation to wildfire.
* Modeling the movement of radioactive materials on a subsistence farm.
* Ecology of mammals and reptiles at Yucca Mountain.
* Impacts of human activities on mammals and reptiles at Yucca Mountain.
* Small-scale genetic change (geographic and temporal) in populations.
* Subspecific taxonomy of *Peromyscus gossypinus*.
* Vertebrate community ecology in the southern Appalachian Mountains.
* Distribution of Lyme disease in the southeastern U.S.
* Wading birds at Cumberland Island National Seashore.
* Control of invasive salt marsh plants without herbicides.
* Effects of fire on small mammal populations.
* Foraging behavior of White-headed Woodpeckers.
* Black bear research and management.

SELECTED PUBLICATIONS

Boone, J.L. 2006. Birding, Hiking, and Naturalizing Around Las Vegas. www.birdandhike.com

Rautenstrauch, K. R., D. L. Rakestraw, G. A. Brown, J. L. Boone, and P. E. Lederle. 2002. Patterns of Burrow Use by Desert Tortoises (*Gopherus agassizii*) in Southcentral Nevada. Chelonian Conservation and Biology, 4(2):398-405.

Walters, J.P., and J.L. Boone. 2002. Effects of Salinity and Sodicity on Vegetation Used for Strip Mine Reclamation in Webb County, Texas. Farco Mining, Laredo, Texas, 33 pp. plus Appendices.

Boone, J. L., and E. A. Holt. 2001. Field Sexing Young Free-ranging Desert Tortoises (*Gopherus agassizii*) Using External Morphology. Chelonian Conservation and Biology, 4(1):28-33.

Boone, J. L., J. Laerm, and M. H. Smith. 1999. Allozyme Variation in the Cotton Mouse (*Peromyscus gossypinus*). Journal of Mammalogy, 80:833-844.

Boone, J. L. 1998. Indirect Impacts of Site Characterization Activities on Small Mammal Populations in the Larrea-Lycium-Grayia Vegetation Association at Yucca Mountain, Nevada: 1991-1997. CRWMS M&O, B00000000-01717-5705-00102.

Lederle, P. E., M. C. Nelson, and J. L. Boone. 1997. A simple, Inexpensive, and Versatile Research Blind. North American Bird Bander, 22:18-21.

Laerm, J., W. M. Ford, M. A. Menzel, T. S. McKay, J. L. Boone, and T. Pig. 1996. Symposium on Appalachian Biodiversity: Soricid Communities in the Southern Appalachians. Virginia Museum of Natural History, Blackburg.

Laerm, J., and J. L. Boone. 1995. Corrections of Records of Occurrence of *Peromyscus polionotus* (Wagner) and *P. gossypinus* (LeConte) (Rodentia: Muridae) in the Blue Ridge Province of Georgia. Brimleyana, 22:9-14.

Boone, J. L., and R. G. Wiegert. 1994. Modeling Deer Herd Management: Sterilization is a Viable Option. Ecological Modeling, 72:175-186.

Boone, J. L., J. Laerm, and M. H. Smith. 1993. Taxonomic Status of the Anastasia Island Cotton Mouse (*Peromyscus gossypinus anastasae*). Journal of Mammalogy, 74: 363-375.

Weed, J., and J. L. Boone. 1992. A Macintosh Computer System for Collecting and Analyzing Rodent Sexual Behavior. Physiology and Behavior, 52: 183-184.

Magnarelli, L. A., J. H. Oliver, H. J. Hutcheson, J. L. Boone, and J. F. Anderson. 1992. Antibodies to *Borrelia burgdorferi* in Rodents in the Eastern and Southern United States. Journal of Clinical Microbiology, 30: 1449-1452.

Boone, J. L., E. Furbish, K. Turner, and S. P. Bratton. 1988. Clear Plastic. A Non-Chemical Herbicide. Restoration and Management Notes, 6:94-95.

WORK EXPERIENCE

Desert Ecologist
Desert Wildlife Consultants, LLC; Las Vegas, Nevada (2000 to present)

Operated my own business doing consulting work for the county government, state government, mining companies, and individuals, focusing mainly on technical publications. During September 2006 to March 2007, I worked as a Tortoise Biologist as an independent contractor. I attended the Desert Tortoise Council Training Workshop in 2007.

I also developed a website (birdandhike.com) about the ecology of the Mojave Desert (flora, fauna, and geology) by providing information on things to do and places to go in the desert around Las Vegas (e.g., hiking, birding, four-wheeling, and other outdoor activities). During this time, I became proficient in GPS and mapping, drove four-wheel drive vehicles to remote locations, and lived and worked under extreme environmental conditions alone and with small groups for extended periods of time. I collected data, organized information, and published results. My formal education focused on vertebrate ecology and wildlife management, but during this time I studied botany and geology to expand the breadth of my understanding of the Mojave Desert ecosystem.

Temporary Field Botanist (4/2006 to 5/2006)
USGS, Western Ecological Research Center, Henderson, Nevada

Set up study plots and measured vegetation in middle-elevation Mojave Desert habitats as part of a study evaluating the response of plants to fire. Responsible for identifying annual and perennial plants to species, counting plants in quadrats, and measuring plant heights along transect lines. Worked with small crews and lived in field camps.

Technical Writer II (1999 to present)
SAIC (4/1999 to 2/2001)
Bechtel-SAIC, Las Vegas, Nevada (2/2001 to present)

Responsible for writing, editing, compiling, and assisting in the production of scientific technical reports (mostly hydrology and geology), engineering reports (e.g., system description documents, facility description documents, and specifications) for the Yucca Mountain Project. Rewrote technical material to levels appropriate for intended audiences (e.g., rewriting technical jargon and conceptually challenging material using words and writing styles that made the resulting text understandable by the general public). Compiled information from original sources and numerous project authors, developed reference lists and data tracking databases, and produced graphics. Worked with authors and reviewers to resolve technical issues and clarify material. Ensured consistency and professional quality. Worked independently and in groups while leveraging knowledge of computer systems to speed the work while reducing the workload and the cost of doing business. Note: In 2001, management of the Yucca Mountain Project changed from SAIC to Bechtel-SAIC.

Animal Ecologist (Senior Scientist) (1995 to 1999)
EG&G/Energy Measurements (4/1995 to 9/1995)
SAIC, Las Vegas, Nevada (9/1995 to 4/1999)

Responsible for conducting long-term impact assessment and ecological research for the Yucca Mountain Project. Engaged in mark-recapture studies of rodent and reptile community dynamics. Curated faunal collections. Supervised scientists in the field and office. Reviewed and edited technical and other documents. Managed data. Manipulated databases including

GPS and GIS data (ArcView). Performed statistical analyses. Authored technical reports and peer-reviewed journal articles. Worked on teams composed of people from a variety of scientific, technical, and non-technical backgrounds in contributing to environmental impact statements. Lead efforts of the ecology team to model the movement of radioactive materials through a desert agroecosystem. My last year in this position was spent analyzing data and writing reports for other environmental scientists, primarily those in the environmental restoration and botanical research groups. By early 1999, all of the environmental research staff had been laid off, and I transferred to a technical writing position. Note: In 1995, management of environmental research on the Yucca Mountain Project changed from EG&G to SAIC.

Manager of Mammal Collections (Research Associate)
Nevada State Museum, Las Vegas, Nevada (1997 to 2001)

Responsible for curating the mammal collection: organized, updated, and maintained the collection of more than 8,000 specimens. Maintained and updated and the computerized collection catalog. Cleaned and prepared specimens. Reviewed, investigated, and updated historical collection records. Provided reports on holdings.

Graduate Student (Teaching Assistant)
University of Georgia, Institute of Ecology and Museum of Natural History, Athens, GA (1990-1995)

Taught labs for Comparative Anatomy, Mammalogy, Vertebrate Natural History, Ecology, and non-majors Biology. Prepared and delivered lectures in classroom and laboratory settings, made and gave exams, and maintained grade lists. Presented guest and substitute lectures in several classes. Organized and trained new teaching assistants. During this time, I conducted my independent dissertation research on the population genetics and morphology of Cotton Mice (Peromyscus gossypinus). I also helped other graduate students characterize vegetation in the north Georgia and North Carolina mountains (count and measure trees, record data on understory plants, coarse woody debris, and physical conditions), study of the distribution of Lyme disease in the Southeast, inventory amphibians and bats in north Georgia, and inventory shrews in North Carolina.

Macintosh Computer Consultant
MacRescue, Athens, GA (1988-1995)

Operated my own computer consulting business. Assisted individuals and institutions in developing Macintosh computer skills and making purchasing decisions. Performed hardware and software maintenance. Taught non-credit courses through the university continuing education program.

Graduate Student (Research Assistant)
University of Georgia, School of Forest Resources, Athens, GA (1987-1989)

Conducted and published independent and directed research projects mostly dealing with small mammals. Analyzed the data and published reports from the floral and faunal studies that I collected in the Georgia and North Carolina coastal marshes during 1987.

Biological Technician
University of Georgia Institute of Ecology, and National Park Service. 1987.

Designed and implemented field studies concerning small mammals, migrant birds, prescribed fire, and invasive plants in coastal barrier-island marsh communities. In Georgia, studies focused on the effects of disturbance and potential beach erosion on ducks and wading birds along an intercoastal waterway (Cumberland Island). In North Carolina, studies focused on small mammals, birds, and invasive plant species in barrier-island sand dune and salt marsh communities (Cape Hatteras). Evaluated several methods to control invasive plants, including fire, mechanical removal (chainsaws), hand removal (hand tools), and covering with clear plastic. We also studied the effects of disturbance in several habitat types on the island. I participated in all of these studies, but for some, I set up, conducted studies, supervised others, collected data, analyzed data, and published the results. I reactivated my Fire Boss card and participated in experimental burns.

Park Ranger
National Park Service. Joshua Tree National Park, Sequoia and Kings Canyon NP, Grand Canyon NP, Lake Mead National Recreation Area (1978-1986; 12 seasons).

Primarily responsible for emergency response and conflict resolution in law enforcement, emergency medicine, search and rescue, technical rock rescue, structural and wildland fire suppression, ambulance, campground operations, visitor programs (campfire programs and nature walks), backcountry patrol, other technical and non-technical aspects of park management. Supervised employees under technically difficult, life threatening, and stressful situations. Documented activities in written form. Participated in resource management activities such as bear research and management, bird studies, bubonic plague surveys, fire management, and vegetation studies. Details available on request.

Forestry Aid
U.S. Forest Service, Clearwater National Forest, Idaho (1975-1976; 2 seasons)

Worked on timber stand improvement, tree planting, timber cruising, controlled burns, and firefighting crews. Timber cruising involved working in teams of two to inventory timber, identify understory plants, take soil samples, inventory coarse woody debris, and identify forest pathogens. The focus of this work was timber inventory (number, height, DBH, condition, disease) using variable radius plots, but we also collected ecological data for forest fire planning and soils data for soil mapping. Used maps, compasses, and chains to navigate the mountains and locate plots. Lived in remote field camps (drive-in and fly-in) for 10 days at a time. Did seedling survival surveys in replanted clearcuts using fixed radius plots. Worked on a timber stand improvement crew using chainsaws to thin trees in regenerating clearcuts. Selected trees to keep based on species, size, and condition, and cut down the others. Participated in controlled burn to remove debris from clearcuts and fought wild fires. Details available on request.

Details available on request.

S T E V E N   C .   F E R R A N D

OBJECTIVE

THIS RESUME IS SUBMITTED FOR CONSIDERATION OF OBTAINING A POSITION AS A BIOLOGICAL MONITOR .

EXPERIENCE

FOSTER WHEELER ENVIRONMENTAL CORPORATION

August 2001 – Present

Approved monitor / handler for flat-tailed horned lizard, burrowing owl, Arroyo toad, and desert tortoises.

CONSTRUCTION MONITORING ASSIGNMENTS

- Monitoring of directional drilling under roads, water ways, and riparian areas in burrowing owl habitat in Blythe and Brawley CA.
- Monitoring of conventional plow installation of ducting in burrowing owl habitat in Blythe and Brawley CA.
- Conducted desert tortoise survey, presence / absence along Hwy 78 for a proposed construction corridor change.

TRAINING THROUGH FOSTER WHEELER

1. Cultural & Environmental Training

BIORESOURCE CONSULTANTS, Carl G. Thelander

September, 2001

- Participated in a raptor survey involving recording raptor usage of non APLIC compliant power poles to determine raptor electrocution frequency.

HDR ENGINEERING **O**ctober 2000 – August 2001

CONSTRUCTION MONITORING ASSIGNMENTS

LEVEL 3 (Lines 04 AND 08)

- Directional drilling 100’ – 5000’ long bores of washes, streams, culverts, roads, Cal Trans off ramps, the New River, Alamo River, and under cultural sites.
- Paving of finished trenching from Santee CA to Alpine CA
- Spider plow installation of ducting west of El Centro CA & from Hesperia CA to Primm NV
- Conventional plow installation of ducting from El Centro CA through the

Algodones Dunes west of Yuma Az.

- Pot holing for utilities throughout El Centro CA
- Trenching for ducting installation with track and back hoes from Santee CA to Yuma AZ & from Hesperia CA to Primm NV
- Rock saw trenching for ducting installation from Santee through Pine Valley CA
- Fiber installation (blowing) east of El Centro CA and from Barstow CA to Baker CA
- Fiber splicing from Barstow CA ILA to Cima Road (between Primm NV & Baker CA)
- Fiber testing from Barstow CA ILA to Cima Road
- Preconstruction sweeps for destert tortoise presence / absence survey from Ogilby Road and I-8 along the construction line to Yuma AZ
- Taught burrowing owl, flat-tailed horned lizard and desert tortoise worker awareness classes on the Level 3 O4 line, Santee CA to Yuma Az. Taught desert tortoise worker awareness classes on the O8 line, Hesperia CA to Primm NV.
- Selected as one of six biologists to conduct preconstruction sensitive plant surveys and flagging from Hesperia CA to Primm NV. This provided information that was used to modify the construction corridor and reduce the impact to native vegetation.
- Field trained biologists that were qualified as tortoise monitors so they could be considered for qualification to be tortoise handlers – 60 hours training each

TRAINING THROUGH HDR ENGINEERING:

1. Biological monitor training
2. Burrowing owl training
3. Flat-tailed horned Lizard training
4. Desert tortoise training
5. Arroyo toad training
6. Union Pacific Railroad training 2000 & 2001
7. Kiewit environmental, cultural & safety training
8. Sexual harassment training

SELF EMPLOYED 1991–September 2000 NEVADA

- Actively involved in Clark County Nevada's Multiple Species Habitat Conservation Plan as a member of the Implementation and Monitoring Committee representing the Searchlight Nevada Town Advisory Board.
- Tortoise monitoring for the University of Nevada at Las Vegas.
- Taught workshop classes for public school educators for Project Wild developed by the Nevada Division of Wildlife.
- Licensed by the Nevada Division of Wildlife to collect selected scientific specimens for the Barrick Museum at University of Nevada at Las Vegas.
- Licensed by the Nevada Division of Wildlife to commercially collect reptiles in

Nevada.

- Wildlife presentations to Nevada public schools (elementary through high school).
- Research assistant for university projects to study the desert tortoise and western chuckwalla.

1975–1990

Employed in the structural steel industry in varying capacities:

- Operations Manager, responsible for company operations, estimating, sales and fabrication of structural steel and reinforcing bar
- Engineering Manager, managed engineering, estimating and detailing departments for structural steel fabrication
- Chief Estimator, managed estimating departments from 3 – 9 estimators
- Estimator, estimated structural steel and pressure vessel projects
- Planner, wrote construction sequence planning for ASME section 8 and nuclear fabricated assemblies
- Steel fabricator working on the shop floor fabricating parts

EDUCATION

1965–1968 Arizona Western College Yuma, AZ

- A.A Applied Sciences1968-1969

1968-1969 Northern Arizona University Flagstaff, AZ

- Major in Zoology, emphasis in Herpetology

INTERESTS

Biological research in herpetology, ecology and conservation biology

REFERENCES

- Alex Heindl, Curator of Reptiles, Barrick Museum, University of Nevada, Las Vegas (702) 895-1401 (office)
- Richard Montanucci, Ph. D., Professor, Department of Biological Sciences, Clemson

University, South Carolina (864) 656-3625 (office)

- Dave Sanger, Biologist, Nevada Division of Wildlife, Reno, NV (administered Project Wild) (775) 688-1500 (office)

- John Wear, Biologist, Biological Resource Specialists, Yucaipa, CA. (909) 797-5740 (office)

- Jim Boone, Ph.D., Ecologist, Las Vegas, NV. (702) 228-4603 (home)

Email: steve@chuckwallas.com

Searchlight, NV 89046 Phone: (702) 296-1616

Zsolt Kahancza

Biologist

Professional summary

Specializing in herpetological and ornithological studies, Mr. Kahancza has studied California's wildlife in the field for over 10 years. Mr. Kahancza has conducted biological and environmental assessment work throughout Orange, Riverside, San Bernardino, San Diego, Imperial, and Los Angeles counties, including Catalina Island. Professional experience includes serving as lead biologist and managing medium size private and public development projects, as well as conducting jurisdictional delineations and focused surveys and monitoring of a variety of endangered, threatened, and/or otherwise sensitive species. In addition, Mr. Kahancza has authored biological assessment reports, focused species survey reports, habitat restoration reports and compliance reports for the western Riverside Multiple Species Habitat Conservation Plan.

Mr. Kahancza has worked with or surveyed for several listed/sensitive species including least Bell's vireo, coastal California gnatcatcher, burrowing owl, California arroyo toad, California red-legged frog, mountain yellow-legged frog, San Gabriel slender salamander, desert tortoise and Coachella Valley milk-vetch. Mr. Kahancza has also received Bureau of Land Management certification for conducting focused surveys for the flat-tailed horned lizard, and has taken part in the Desert Tortoise Council/Surveying, Monitoring, and Handling Techniques Workshop.

Other professional duties Mr. Kahancza has conducted include habitat restoration monitoring in upland and riparian habitats and jurisdictional delineation of waters of the U.S. at various study sites throughout Riverside and Los Angeles Counties. Mr. Kahancza has also assisted with the preparation of an aquatic permit package for an ephemeral drainage, as well as monitored riparian vegetation removal in Riverside County for three consecutive years for the Metropolitan Water District.

In order to comply with the Coachella Valley MSHCP like-exchange process, I conducted surveys in order to analyze the functions and values of potential exchange habitat.
Collected vegetation data in San Diego County, San Bernardino National Forest lands, and on Santa Catalina Island utilizing point-intercept on line transects.

Professional qualifications

Permits
California Scientific Collection Permit

Education

BA, Biology, California State University San Bernardino, Conferred 1994

Post-baccalaureate coursework, California State University San Bernardino, 1995-1996

Post-baccalaureate coursework, California State Polytechnic University Pomona, 1999-2000

Additional training

- Enrolled in Geographic Information Systems Certificate Program at UCR Extension
- BLM Flat-tailed Horned Lizard Monitor Training; May, 2007
- The Desert Tortoise Council/Surveying, Monitoring, and Handling Techniques Workshop; November, 2006
- Wilderness First Aid/CPR Certification, National Safety Council; April, 2003

Location

Riverside, California, USA

Languages

English (native)

Summary of core skills

Experience with Sensitive Amphibian and Reptile Species

Has operated pit fall traps throughout southern California on a regular basis, which involved extensive handling of reptiles, amphibians and small mammals, including collection of tissue samples.

Has spent three seasons conducting daytime tadpole and nighttime adult surveys for California arroyo toads in the San Bernardino County foothills, and on Camp Pendleton Marine Corps Base during which the target species was heard and/or observed.

Has worked a major part of two field seasons surveying streams and drainages located throughout the San Bernardino and Angeles National Forests for all life stages of the federally listed mountain yellow-legged frog.

Has worked a major part of two field seasons surveying streams and drainages located throughout the San Bernardino and Angeles National Forests for all life stages of the federally listed mountain yellow-legged frog.

Spent a major part of three field seasons monitoring a known population of California red-legged frogs on Angeles National Forest lands.

Has surveyed canyons and springs in the San Bernardino Mountains for presence of sensitive slender salamander species.

Conducted desert tortoise surveys in San Bernardino and Imperial Counties during which old tortoise sign was observed.

Experience with Sensitive Bird Species

Has conducted focused burrowing owl surveys and/or pre-construction surveys throughout Riverside, Los Angeles and San Bernardino Counties, and prepared burrowing owl survey reports. Also supervised a passive burrowing owl relocation effort, conducted post relocation surveys and wrote relocation report.

Has worked as a summer intern on the Monitoring Avian Productivity and Survivorship (MAPS) project, during which he was responsible for the operation of mist nets, processing of captured birds, which included banding, sexing, and aging the birds, and conducting vegetation analysis at six different stations located throughout Orange County.

Zsolt Kahancsa

Has volunteered approximately 400 hours helping to record the movements and behavior of threatened Coastal California Gnatcatchers at Lake Matthews Ecological Reserve in Riverside, as well as other sites throughout Southern California.

Hass assisted in defining habitat of banded pairs through quadrant sampling centered at their nest locations, and by line transect sampling taken throughout the pairs' territories.
Assisted in a coordinated effort to mist net and band gnatcatchers, as well as inspected and cataloged incidences of predation and parasitism on nest sites.

Has contributed to an intensive three-month study in Riverside County, on the edge effects and selection of breeding territories by the Rufus Crown Sparrow.

Experience with Sensitive Invertebrates

Has conducted surveys in the Palm Springs areas for sensitive Casey's June beetles.

Experience with Mammal Species

Has assisted in the capture and GPS/radio collaring of bobcats in Orange County.

Has utilized radio telemetry techniques to locate Desert Bighorn Sheep in the Palm Springs and Palm Desert areas.

Experience with Sensitive Plants

Employment history

2009 – Present	Biologist, AMEC Earth & Environmental, Inc., Riverside, CA
2006 – 2009	Biologist, HELIX Environmental Planning, Inc., Riverside, CA
2001 – 2005	Biological Science Technician (Wildlife), U.S. Geological Survey, Biological Resources Division, San Diego, CA
2000 – 2001	Biological Science Research Assistant III, San Diego State University Foundation, San Diego, CA
2000	Summer Field Biologist Intern, Institute for Bird Populations, Point Reyes Station, CA
1997 – 1999	High School Biology Teacher, Herbert Hoover High School, Glendale, CA
1993 – 1997	Volunteer, U.S. Fish and Wildlife Service, Carlsbad, CA

TED RADO BIOLOGICAL CONSULTING

Threatened & Endangered Species Surveys	**Environmental Reports**
Section 7 and Section 10(a) Permitting	**Regulatory Review**
Habitat Conservation Plans	**Mitigation Planning**
NEPA/CEQA - CDFG 2081 Permitting	**Project Planning**
Environmental Education Programs	**Construction Monitoring**

3144 Celeste Dr., Riverside, CA 92507 • Office (951) 369-8510

Ted Rado

Date of Birth: January 10, 1952

Current Address: 3144 Celeste Drive
Riverside, California 92507

Telephone Number: 951/369-8510

Education: San Jose State University
B.A. Zoology - December 1974
M.A. Biology - August 1977

EXPERIENCE

1989-2004 Independent consulting biologist. Work has included field surveys, report preparation, and preparation of Habitat Conservation Plans and related documents. Projects have included oilfield actions, prison construction and permitting, wind energy, mining, pipelines, roads, and urban development.

1989-Mar 1990 Wildlife biologist. U.S. Bureau of Land Management, Riverside, California. Preparation of an EIS addressing regional control of ravens, assisting Area Offices with various projects affecting desert tortoises, and development of mitigation measures for the desert tortoise.

1984-1989 Wildlife Biologist. U.S. Fish and Wildlife Service, Endangered Species Office, Sacramento, California. Work included preparation of Section 7(a) biological opinions and development of conservation plans for regional Section 10(a) permit applications.

1981-1984 Wildlife Biologist. U.S. Bureau of Land Management, Barstow, California. Development and implementation of management plans for wildlife and sensitive habitats and review of many projects affecting desert wildlife.

1980-1981 Wildlife Biologist. U.S. Bureau of Land Management, Sacramento, California. Employed as an endangered species specialist for the Resources Division of the State Office. Duties included assisting both District and Field Offices state-wide with compliance with the Endangered Species Act.

1979-1980 Wildlife Biologist. U.S. Bureau of Land Management, Riverside, California. Employed as a member of the Desert Planning Staff developing a comprehensive management plan for 12 million acres of Federal lands in the California Deserts.

1975-1978 Seasonal Park Ranger. Conducted faunal inventories of Hovenweep National Monument (Utah-Colorado) and Fossil Butte National Monument (Wyoming). Work included systematic live-trapping of small mammals.

Professional Organizations:

American Society of Mammalogists
Herpetologist's League
Society for the Study of Amphibians and Reptiles
Desert Tortoise Council

Certifications:

Certified biologist on lists for San Bernardino, Kern, Los Angeles, Orange, Ventura, and Riverside Counties, California
Completed desert tortoise training workshop (1990) Completed Mohave ground squirrel workshop, sponsored by The Wildlife Society
State small mammal livetrapping permit
Authorized to livetrap Mohave ground squirrels
Current State Memorandum of Understanding for handling the desert tortoise

Partial List of Publications:

Rado, T.A. and P.G. Rowlands. 1981. A range extension and low elevational record for the Arizona ridgenose rattlesnake, Crotalus willardi willardi. Herp. Review. 1981:15-16.

Rado, T.A. 1990. Results of the 1989 pilot raven control program. The Desert Tortoise Council: Proceedings of the 1990 Symposium.

Rado, T.A. 1993. An overview of mitigation actions employed for selected endangered species in the San Joaquin Valley. Pp. 199-206. In: D. Williams, S. Bryne and T. Rado (eds.) Endangered and sensitive species of the San Joaquin Valley, California: a conference on their biology, management and conservation. 388 pp.

Laudenslayer, W.F., K.B. Buckingham, and T.A. Rado. 1995. Mammals of the Deserts of California. In: J. Latting and P.G. Rowlands (eds.): The California Desert: An

Introduction to Natural Resource's and Man's Impact. California Native Plant Society. Pp. 373-396.

Partial List of Projects:

2004 **Southern Trails Pipeline Coating Inspection Project, San Bernardino, Riverside and Los Angeles Counties.** Did initial surveys, monitored during inspections, and prepared final report on project where pipeline coating inspections took place over 200 linear miles of line.

2004 **Frontier Homes Construction Project, Victorville.** Provided crew with environmental compliance training, conducted preactivity survey and monitored during land clearing for housing subdivision.

2004 **Hilton Gardens Inn Project, Victorville.** Preactivity survey, crew compliance training, site monitoring for large hotel construction site.

2004 **Bolthouse Farms Project, Los Angeles County.** Site survey and report. Also prepared long-term monitoring plan for wildlife.

2004 **Aster Villas and New Homes Housing Projects, Adelanto.** Assisted in site monitoring for compliance during construction. Burrowing owl and Mohave ground squirrel issue species.

2004 **Suncal McAllister Ranch Burrowing Owl Survey, Kern County.** Project surveys for burrowing owls and nesting sites for large-scale planned housing development southwest of Bakersfield.

2004 **Ajax Services Commercial Development, Adelanto.** Biological resource survey and report for planned commercial development.

2004 **Aquino Commercial development Site, Victorville.** Biological resources survey and report for planned commercial development.

2004 **March Air Force Base Bunker Inspection, Riverside County.** Monitored during soils tests of cleared weapons bunkers at the base. Emphasis on the Stephen's kangaroo rat.

2004 **Forecast Homes State 2081 Permit, San Bernardino County.** Prepared draft State 2081 (Endangered Species Permit) for proposed housing subdivision emphasizing the Mohave ground squirrel.

2004 **Whitewater Rock Mine, Riverside County.** Assisted in surveys of proposed mine expanion, with emphasis on the desert tortoise and rare plants.

2004 **Moreno Valley Burrowing Owl Survey, Riverside County**. Completed burrowing owl survey of proposed subdivision site and prepared summary report for submittal to County for large consulting company.

2004 **Suncal Properties McAllister Ranch Project, Kern County.** Reviewed prior FEIR and data records for large property being considered for development southwest of Bakersfield. Also assisted in blunt-nosed leopard lizard inventory of this site.

2004 **Terrazas Mine, Riverside County.** Assisted in survey of mine expansion project along the western edge of the desert in central Riverside County. Emphasis on the desert tortoise and rare plants.

2004 **Airway Boulevard Extension Project, Kern County.** Road expansion survey in the western Mojave Desert. Emphasis on the desert tortoise.

2004 **San Joaquin Valley Landbank Project, Kern County.** Reviewed several potential sites in the valley as prospective mitigation "landbanking" sites for a large pipeline company.

2004 **Slate Range Communications Site, Inyo County.** Completed biological survey and prepared report for comm site near Death Valley.

2004 **Southern Nevada Water Authority Surveys, Clark County, Nevada.** Member of a team of biologists conducting surveys for a large company for the desert tortoise and rare plants over proposed water conveyance and stoage system in southern Nevada.

2004 **Mohave Ground Squirrel Livetrapping Survey, 30-Acre Site in Victorville.** Completed systematic livetrapping survey using California Department of Fish and Game protocols.

2004 **Mohave Ground Squirrel Livetrapping Survey, 55-Acre Site in Adelanto.** Completed systematic livetrapping survey using California Department of Fish and Game protocols.

2004 **Mohave Ground Squirrel Livetrapping Survey, 10-Acre Site in Adelanto.** Completed systematic livetrapping survey using California Department of Fish and Game protocols.

2004 **Mohave Ground Squirrel Livetrapping Survey, 30-Acre Site in Lancaster.** Assisted in a systematic livetrapping survey using California Department of Fish and Game protocols.

2004 **Joshua Tree Land Development, San Bernardino County.** Assisted in systematic survey of

90-acre parcel bordering Joshua Tree National Park. Emphasis on the desert tortoise.

2003 **Questar Road Grading Survey, San Bernardino County.** Conducted desert tortoise survey of 66 linear mile segment of pipeline maintenance road. Submitted summary report to company for agency review.

2003 **Conoco-Phillips Marsh Creek Repair Project, Alameda County.** Conducted survey of pipeline repair project near Mt. Diablo, with emphasis on the red-legged frog, Alameda striped whipsnake, California tiger salamander and western pond turtle. Discussed mitigation with company representative.

2003 **Shea Properties Project, Riverside County.** Conducted desert tortoise surveys of four separate sites in the Coachella Valley.

2003 **Atolia Comm Site Preactivity Survey, Kern County.** Conducted desert tortoise survey of communications site near Randsburg. Gave construction crew environmental compliance training. Assisted in tortoise-proof fence construction.

2003 **Desert Dunes Project, Riverside County.** Member of crew conducting surveys of proposed subdivision in the Coachella Valley. Emphasis on the desert tortoise, rare plants, Coachella Valley fringe-toed lizard, burrowing owl and Coachella round-tailed ground squirrel.

2003 **Metropolitan Water District Colorado River Aqueduct Repairs, San Bernardino County.** Member of team conducting preactivity surveys and monitoring during repairs of segment of the aqueduct in the Mojave Desert. Emphasis on the desert tortoise.

2003 **Tosco Kern Station Tank and Pipeline Demolition, Kern County.** Conducted site surveys and monitored as crew dismantled and removed equipment from facility in the Kern Oilfield. Emphasis on the San Joaquin kit fox and the Bakersfield cactus.

2003 **Coachella Water District Site Survey, Riverside County.** Worked as a member of a team conducting desert tortoise surveys of property near La Quinta, with emphasis on the desert tortoise.

2003 **Whitewater Canyon Alluvial Rock Quarry Site, Riverside County.** Worked as a member of a team conducting surveys of an approximately one-linear mile segment of Whitewater Canyon, with emphasis on the endangered arroyo toad.

2003 **Metropolitan Water District Patrol Road Maintenance, San Bernardino County, California and Clark County, Nevada.** Did preactivity surveys and monitoring during maintenance of existing patrol road segments in the eastern Mojave Desert, with emphasis on the desert tortoise.

2003 **Neuvo Buena Vista to E+M Pipeline Survey, Kern County.**
Worked as a member of a 4-person team conducting surveys of an approximately 15-linear mile pipeline segment in the southern San Joaquin Valley. Emphasis on many species, including the San Joaquin kit fox, blunt-nosed leopard lizard, San Joaquin antelope squirrel, burrowing owl, giant kangaroo rat and Hoover's woolly-star.

2003 **California City Oasis Project, Kern County.** Worked as a member of a team conducting surveys of a proposed camping area on the northern edge of California City, with emphasis on several rare plants, the desert tortoise, Mohave ground squirrel and burrowing owl.

2003 **California City High School Site, Kern County**. Assisted in conducting surveys of a proposed high school site in California City. Prepared summary report. Emphasis on the desert tortoise, Mohave ground squirrel, burrowing owl, and rare plants.

2003 **California City Elementary School Site, Kern County.** Assisted in conducting surveys of a proposed elementary school site in California City. Prepared summary report. Emphasis on the desert tortoise, Mohave ground squirrel, burrowing owl, and rare plants.

2003 **MCAGCC Range 500 Tortoise Survey, San Bernardino County.** Crew supervisor conducting surveys of a variety of facility sites at Range 500 near Twentynine Palms. Data (including GPS coordinates) recorded and provided to primary contractor for the military project. Emphasis on the desert tortoise.

2003 **Hyundai Vehicle Test Site Tortoise Surveys, Kern County.** Team member conducting desert tortoise surveys within an approximately 2,000-acre area in the western Mojave Desert.

2003 **Coachella Canal Line Project Survey, Imperial County.** Crew supervisor conducting desert tortoise surveys along an approximately 33-linear mile segment of the Coachella Canal.

2003 **SCE Devers-West Transmission Line Survey, Orange and Riverside Counties.** Worked as a member of a team conducting general bio surveys along two 80-linear mile segments of existing transmission line right-of-way. Emphasis on a variety of listed and sensitive species.

2002 **Metropolitan Water District - Colorado River Aqueduct Repairs, San Bernardino County.** Member of team conducting preactivity surveys and site monitoring during repairs of sections of the aqueduct in the Mojave Desert.

2002 **Sempre Energy - Line 1080 Repair, Riverside County.** Member of team conducting preactivity surveys and site monitoring for desert tortoises during replacement of a six linear mile segment of natural gas pipeline in the Mojave Desert.

2002 **Questar Pipeline Spread 7 Construction, San Bernardino County.** Conducted preactivity surveys, did site monitoring and post-project compliance report for work over a 35-linear mile segment of pipeline in the eastern Mojave Desert. Emphasis on the desert tortoise.

2002 **BNSF Lateral Pipeline, San Bernardino County.** Conducted surveys, prepared report, did project monitoring and completed post-project monitoring report for pipeline supplying fuel to the BNSF railroad yard in Barstow. Emphasis on a variety of species, including the burrowing owl and the desert tortoise.

2002 **Questar Spread 3B Construction, San Bernardino County.** Conducted preactivity surveys, did site monitoring and post-project compliance report for work over a 35-linear mile segment of pipeline in the eastern Mojave Desert. Emphasis on the desert tortoise.

2002 **Sempre Energy Adelanto-Kramer Pipeline Project, San Bernardino County.** Worked as a member of a team conducting preactivity surveys and monitoring during the construction of a 36-inch trunk natural gas pipeline extending across the central Mojave Desert. Emphasis on the desert tortoise.

2002 **Kinder Morgan Energy Partners Draft Biological Evaluation, California and Nevada.** Reviewed and incorporated editorial comments and suggestions received on preliminary draft also written by myself addressing regional pipeline operations and maintenance and returned to company.

2002 **BNSF Lateral burrowing Owl Survey, San Bernardino County.** Completed a preactivity survey of a pipeline segment, with emphasis on checking a previously noted burrowing owl nesting site for signs of current activity.

2002 **Questar Pipe Line Cabazon Reroute Project, Riverside County.** Completed a preactivity survey of pipeline reroute segment, with emphasis on the desert tortoise and several sensitive species.

2002 **Questar Pipeline Spread 7 Construction, San Bernardino County.** Conducted preactivity surveys, did site monitoring and post-project compliance report for work over a 35-linear mile segment of pipeline in the eastern Mojave Desert. Emphasis on the desert tortoise.

2001 **Level 3 Fiber-optic Line, Victorville to Stateline Project.** Worked as a member of a team conducting surveys and monitoring during placement of an approximately 200 linear mile segment of fiber-optic line in the Mojave Desert. Sensitive plants, Mohave ground squirrel and the desert tortoise were the principal species of concern.

2001 **Questar Pipe line Company Road Repairs, San Bernardino County.** Conducted surveys and monitored construction crew effecting repairs of pipeline maintenance road in the eastern Mojave Desert.

2001 **Tosco Polonio Pass Project, San Luis Obispo and Kern Counties.** Worked as a subconsultant conducting arroyo toad and California red-legged frog survey.

2001 **U.S. Borax Sensitive Plant Surveys, Kern County.** Worked as a team member conducting spring surveys around active portions of the mine for sensitive plants and the desert tortoise.

2001 **Metropolitan Water District Washout Repairs, Riverside and San Bernardino Counties.** Conducted surveys and monitored as construction crew repaired patrol road washouts from thunderstorm damage.

2001 **Metropolitan Water District Road Surveys, California and Nevada.** Conducted desert tortoise and sensitive species surveys over approximately 300 linear mile segment of the patrol road system in the Mojave Desert.

2001 **Ludlow Quarry Pit, San Bernardino County.** Conducted surveys and prepared report for 60-acre quarry pit for
I-40 repairs, with emphasis on rare plants and the desert tortoise.

2001 **Southern Rubber Boa Survey, San Bernardino Mountains.** Conducted survey to look for and evaluate habitat of the southern rubber boa along a proposed water pipeline corridor.

2001 **Sands Project, San Bernardino County.** Conducted biological survey as a team member of Union Pacific Railroad sites slated for cleanup in the eastern Mojave Desert, with emphasis on the desert tortoise.

2001 **Atolia Communications Site, Kern County.** Conducted biological survey of comm site in the Mojave Desert and prepared summary report text.

2000 **Level 3 San Diego-Yuma Fiber-optic Line, San Diego and Imperial Counties.** Team member to parent engineering firm conducting surveys and monitoring of portions of line, with emphasis on sensitive plants and the endangered arroyo toad.

2000 **Level 3 Las Vegas-Stateline Fiber-optic Line, Clark County, Nevada.** Team member to parent engineering firm conducting surveys and monitoring of portions of line, with emphasis on the threatened desert tortoise.

2000 **Level 3 Fiber-optic Line, Corona Area, Riverside County.** Team member to parent engineering firm monitoring construction, with emphasis on riparian habitats.

2000 **Metropolitan Water District Desert-wide Operations and Maintenance Projects, California and Nevada.** Prepared draft biological evaluation report addressing ongoing operations and maintenance of Colorado River Aqueduct, access roads, transmission lines, pump stations and associated facilities on listed and sensitive species.

2000 **Metropolitan Water District Road Maintenance, Riverside and San Bernardino Counties.** Conducted surveys and prepared summary report addressing road maintenance over about 125 linear miles of facility roads. Environmental compliance training to staff.

2000 **Calnev Pipe Line Company Block Valve Survey, California and Nevada.** Conducted surveys and prepared report addressing maintenance work on four block valve sites in the Mojave Desert, with emphasis on the desert tortoise.

2000 **U.S. Borax Sensitive Plant Surveys, Kern County.** Team member conducting systematic surveys on outer edges of borax mine, with emphasis on several sensitive plants and the desert tortoise.

2000 **Glamis Imperial Project, Imperial County.** Reviewed text of proposed Federal mineral withdrawal surrounding mine and prepared summary text for company.

2000 **Glamis Imperial Project, Imperial County.** Reviewed text of final biological opinion for the mine site, and prepared summary text for the company.

2000 **TXI Quarry Site, San Bernardino County.** Team member conducting tortoise and sensitive plant surveys near Victorville.

2000 **Southern California Gas Company Line 173 Leak Survey, Kern County.** Conducted preactivity surveys of San Joaquin kit foxes, blunt-nosed leopard lizards and other listed and sensitive species.

2000 **Southern California Gas Company Desert Project Surveys, Riverside County and San Bernardino County.** Surveys of over 20 operations and maintenance projects proposed for calendar year 2000, in tortoise habitat areas for parent firm.

2000 **Southern California Gas Company, San Joaquin Valley Operations and Maintenance Project Surveys, Kern County.** Surveys of over 10 project sites in the southern San Joaquin valley slated for year 2000 work, with emphasis on several listed and sensitive plants and wildlife for parent firm.

2000 **Coalinga Cogeneration Project, Fresno County.** Annual check of cogeneration site and associated steam field service area for compliance with Section 10(a) permit prepared in 1990.

2000 **Questar Line 90 Endangered Species Habitat Correlations, California and Western Arizona.** Aerial photoanalysis review and ground-truthing to accurately map locations and extent of endangered species habitat along an approximately 285 linear mile pipeline segment extending through the Mojave Desert for a parent consulting firm.

2000 **ATT San Diego-Blythe Fiber-optic Surveys, Imperial and Riverside Counties.** Subconsultant and field crew supervisor to parent firm conducting systematic surveys of approximately 125 linear miles of fiber-optic line. emphasis on several listed plants in the Algodones Dunes (Pierson's milk-vetch, Algodones Dunes sunflower), flat-tailed horned lizard and the desert tortoise. Preparation of draft summary report for the parent firm.

1999 **Questar Pipe Line Company road Maintenance, San Bernardino County.** Conducted preactivity surveys and monitored during patrol road maintenance over 15-linear mile segment in the eastern Mojave Desert. Emphasis on the desert tortoise.

1999 **Needles Landfill Perimeter Fence Construction, San Bernardino County.** Conducted preactivity surveys and monitored during placement of a tortoise-proof fence around the perimeter of the Needles landfill.

1999 **Arroyo Toad Surveys, Summit Valley Ranch, San Bernardino County.** Lead biologist conducting surveys for the endangered arroyo toad in segments of Little Horsethief Creek and Horsethief Creek. Summary report completed.

1999 **U.S. Borax Desert Tortoise Surveys, Kern County.** Worked as a member of a team conducting systematic surveys of a portion of the mine for the desert tortoise.

1999 **Southern California Gas Company Desert Road Grading Maintenance, Riverside County.** Monitor during road maintenance along an approximately 40-linear mile segment of patrol road, with emphasis on the desert tortoise. For parent firm.

1999 **Southern California Gas Company, Belridge Oilfield Maintenance, Kern County.** Monitoring during pipeline corrosion repair in the San Joaquin Valley, with emphasis on the San Joaquin kit fox, San Joaquin antelope squirrel and the blunt-nosed leopard lizard. For parent firm.

1999 **Southern California Gas Company, Line 8090 Leak Repairs, Kern County.** Monitor during repairs of several pinhole leaks in the valley near Taft. Emphasis on the San Joaquin kit fox, Hoover's woolly-star, blunt-nosed leopard lizard, and San Joaquin antelope squirrel. For parent firm.

1999 **Questar Pipe Line Company, Habitat Mapping of Line 90 in California.** Mapping of habitats using aerial photos and ground-truthing of an approximately 250-linear mile segment of pipeline.

1999 **Questar Southern Trails Pipeline, California and Arizona Interconnects.** Field surveys of Topock Interconnect and Transwestern Interconnect sites, with emphasis on sensitive species and the desert tortoise.

1999 **Tosco PN10 Pipeline Project, Elk Hills, Kern County.** Crew member conducting preactivity surveys and monitoring during construction of a 20-linear mile pipeline at Elk Hills. Emphasis on several listed species, including the San joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, and Hoover's woolly-star.

1999 **Arroyo Toad Surveys, San Bernardino and Cleveland National Forests.** Worked as a member of a team conducting systematic surveys of several drainages for the endangered arroyo toad for the U.S. Forest Service.

1999 **Yellow-legged and Red-legged Frog Surveys, Cleveland and San Bernardino National Forests.** Worked as a member of a team conducting systematic surveys of several drainages for the endangered California red-legged frog and the yellow-legged frog for the U.S. Forest Service.

1999 **Metropolitan Water District Road Maintenance, San Bernardino County.** Surveys of approximately 100 linear miles of roads for desert tortoises and other sensitive species prior to road grading. Preparation of summary report.

1999 **Cima Pump Station, San Bernardino County.** Field surveys and report preparation addressing construction and operation of a pipeline pump station in the eastern Mojave Desert.

1999 **Questar Line 90 Conversion, California-Western Arizona Segments.** Review of database records, selected field surveys, and preparations of two reports for presentation by a parent consulting firm to the Federal Energy Regulatory Commission for a 600-linear mile pipeline conversion from crude oil to natural gas transport.

1998 **Questar Pipe Project, San Bernardino and Riverside Counties.** Surveys and preparation of a draft report as a subconsultant to a larger firm.

1998 **Southern California Gas Company Road Maintenance, San Bernardino and Riverside Counties.** Monitoring of road grading for tortoises and other sensitive species in the Mojave Desert. Preactivity surveys and environmental compliance training of personnel.

1998 **Summit Valley Ranch Arroyo Toad Survey, San Bernardino County.** Surveys of two drainages for endangered arroyo toads, calculations of estimated papulation size using field-generated data. Summary report.

1998 **R Ranch Sensitive Plant Survey, Riverside County.** Sensitive plant survey of proposed development site in the San Jacinto Mountains.

1998 **Interstate 15 Mohave River Crossing Arroyo Toad Survey, San Bernardino County.** Surveys of river channel and banks at highway overcrossing for the endangered arroyo toad.

1998 **Hi Grade Plant Transects, San Bernardino County.** Survey member establishing baseline at mine site for later site restoration work.

1998 **Calnev Biological Assessment, Southern California-Nevada.** Continued development of project-wide permit allowing for operations and maintenance of interstate pipeline corridor in endangered species habitats.

1998 **Greenleaf II Reservoir Project, Orange County.** San Diego horned lizard habitat evaluation of small proposed reservoir site in Whittier.

1998 **Glamis Imperial Project, Imperial County.** Review of draft biological opinion for large-scale mining operation.

1998 **Aera Wastewater Line, Kern County, California.** Surveys for San Joaquin kit fox, blunt-nosed leopard lizard and other listed and sensitive species west of Bakersfield.

1998 **Valley Waste Project, Kern County.** Surveys for San Joaquin kit fox, blunt-nosed leopard lizard and other listed and sensitive species west of Bakersfield.

1998 **Calspar Mine, San Bernardino County.** Site surveys and preparation of a summary report for a small-scale mining operation southeast of Barstow.

1998 **Temecula Wash Horned Lizard Monitoring, Riverside County.** Continued surveys and monitoring of release area for San Diego horned lizards.

1998 **Mesquite Mine, Imperial County.** Preactivity surveys of exploratory drilling area for desert tortoises.

1998 **Edwards Air Force Base Water Pipeline, Kern County.** Monitoring during trenching and placement of water pipeline near Phillips Lab area.

1998 **Edwards Air Force Base Homestead Wellsite Closures, Los Angeles and Kern Counties.** Monitoring during groundwater testing and well closure on the base.

1998 **Needles Landfill, San Bernardino County.** Desert tortoise monitoring during construction of perimeter landfill fence. Endangered species compliance training for staff.

1998 **ARCO Orion Project, California.** Surveys, monitoring, and endangered species compliance training during purging and monitoring of a 16-inch crude oil line in the Mojave Desert involving approximately 100 personnel.

1998 **ARCO Pipe Line Maintenance and Operations Projects, San Bernardino County.** Surveys, monitoring and reports for approximately 35 separate projects along a 150-linear mile segment of crude oil pipeline in the Mojave Desert.

1997 **Metropolitan Water District Road Maintenance, Nevada-California.** Surveys of 183 miles of maintenance roads in the Mojave Desert for sensitive species including the desert tortoise. Preparation of summary report for the agencies.

1997 **ARCO Pipe Line Operations and Maintenance Projects, Riverside and San Bernardino Counties.** Surveys, monitoring and report addressing approximately 40 separate projects over the calendar year.

1997 **Interstate Highway 15 Widening, San Bernardino County.** Member of team conducting desert tortoise and other sensitive species surveys along highway corridor between Victorville and Barstow.

1997 **Mountain Falls Survey, Riverside County.** Bio survey of proposed golf course site, including checks of spring area for sensitive amphibians including the red-legged frog.

1997 **Shadow Rock Amphibian Survey, Riverside County.** Combination of red-legged frog and arroyo toad survey of proposed golf course site near Palm Springs.

1997 **Victorville Landfill Survey, San Bernardino County.** Desert tortoise survey of proposed landfill expansion area.

1997 **La Quinta Traditions Golf Course, Riverside County.** Participated in survey of large golf course project site near Palm Springs.

1997 **Sunwest Sensitive Plant Survey, Riverside County.** Participated in surveys for several listed and sensitive plants on a large-scale sand and gravel operation.

1997 **Picacho Peak Exploratory Drilling, Imperial County.** Completed survey and prepared report addressing 15 exploratory drill holes for a proposed mining operation near Picacho Peak.

1997 **Airtouch Comm Sites, San Bernardino County.** Completed surveys and prepared report addressing the installation of six comm sites in the Mojave Desert.

1997 **Elk Hills Sensitive Plant Survey, Kern County.** Participated in a systematic survey over most of NPR-1 for listed and sensitive plants for the U.S. Department of Energy.

1997 **Western Geophysical Seismic Survey, Kern County.** Participated in surveys for T+E species in the Belridge Oilfield.

1997 **Big Morongo Canyon Pipeline Realignment, Riverside County.** Monitor during pipe realignment for the Southern California Gas Company.

1997 **Big Morongo Canyon Plant Survey.** Systematic survey of canyon and tributaries for the endangered triple-ribbed milk-vetch. Summary report for agencies.

1997 **CalWest Spring Floral and Revegetation Survey, riverside County.** Sensitive plant survey of large-scale sand and gravel operation.

1997 **Amboy Quarry Vegetation Transects, San Bernardino County.** Participated in the collection of baseline plant data to be used for later project monitoring and revegetation success.

1997 **Temecula Creek Coast Horned Lizard Relocation Study, Riverside County.** Participated in the capture, marking and release with subsequent monitoring of 10 San Diego horned lizards on to a rehabilitated project site.

1997 **Rand Mining Clearance Survey, Kern County.** Completed desert tortoise survey of approximately 40-acre portion of mine and prepared summary report.

1997 **American Girl Mine Drillsites, Imperial County.** Completed survey of approximately 15 exploratory drilling sites and prepared summary report.

1996 **AirTouch Cellular Comm Sites, Riverside County.** Completed survey of two cell phone comm sites and prepared summary report.

1996 **California City Golf Course, Kern County.** Participated in survey of approximately 1,200 acre area north of Highway 58 for desert tortoises and other listed and sensitive species.

1996 **ARCO Line 90 Rectifiers, San Bernardino County.** Completed initial surveys, monitoring and post-project report for the installation of 10 rectifiers in the Mojave Desert.

1995 **Eagle Mountain Landfill, Riverside County.** Reviewed court decision on landfill as it related to endangered and sensitive species. Prepared summary brief for client.

1995 **American Girl Mine, Imperial County.** Completed survey and report of buildout of ore processing area on mine.

1995 **Coalinga Cogeneration Company, Fresno County.** Completed annual endangered species compliance monitoring of cogeneration project in the Coalinga Oilfield.

1995 **Mendenhall Property Dispute, Washington County, Utah.** Assisted property owner in HCP area in negotiations with the U.S. Fish and Wildlife Service. Settled satisfactorily to both entities.

1995 **Southern California Gas Company, Kern County.** Provided deposition and expert witness testimony in California Superior Court on endangered species and the Endangered Species Act.

1995 **ARCO Pipe Line Monitoring, San Bernardino County.** Completed required reports, conducted preactivity surveys, on-site monitoring during projects, and preparation of year-end agency reports for approximately 60 different operations and maintenance projects.

1995 **Big Morongo Canyon Pipeline Realignment, Riverside County.** Completed initial site surveys and report addressing realignment of about two miles of exposed pipe in a riparian stream,. Also completed draft environmental assessment for the U.S, Bureau of

Land Management. Met with agencies to review endangered species and wetland permitting and protection measures. Developed environmental compliance guide specifically for project crew. Monitored site during project. Completed post-project evaluation and monitoring report.

1995 **Rand Water Pipeline Construction, Kern County.** Completed pre-project survey and project monitoring during construction of about two miles of 10-inch water pipeline across desert tortoise habitat.

1995 **Rand Project Clearance Surveys, Kern County.** Completed clearance of approximately 800 acres for the desert tortoise as a mitigation measure for the project EIS. Captured, marked and released 14 desert tortoises from the project site. Completed post-project monitoring report for agencies.

1995-96 **Calnev Pipeline Company, California-Nevada.** Preparation of draft biological assessment addressing ongoing operations and maintenance of over 250 miles of pipelines in the Mojave Desert. Meetings with agency staffs during preparation.

1994 **Southern California Gas Company Programmatic Permit.** Preparation of biological assessment addressing ongoing operations and maintenance over 1,100 miles of natural gas pipelines in the California Desert. Meetings with agency staffs during preparation.

1994-95 **Southern Nevada Water Authority, Las Vegas.** Preliminary scoping surveys for T+E species along various project alternative routes for the secondary system for the City of Las Vegas. Species included the desert tortoise, bearpaw poppy, sticky buckwheat, relict leopard frog, and arroyo toad.

1994-97 **Chemgold Imperial Project, Imperial County.** Conducted surveys of over 2,000 acre proposed mine site and associated road and transmission line corridors. Prepared biological assessment, assisted in the preparation of the project EIS/EIR. Monitored exploratory drilling of about 300 test holes on the site. Participated in negotiations with agencies on project compensation, incidental take limits and mitigation.

1994 **Line 90 Crude Oil Leak, San Bernardino County.** Monitored cleanup of crude oil leak in the Mojave Desert near Yucca Valley.

1994 **City of Bakersfield Northeast Sewer Trunkline Habitat Conservation Plan, Kern County.** Preparation of a multi-species HCP for buildout on north side of the city. Biological assessment, draft biological opinion, and draft State 2081 permit for project.

1994 **Rand Mine, Kern County.** Preconstruction surveys, reports and monitoring of two mile pipeline through desert tortoise habitat.

1994-95 **Federal Highway Administration, Ft. Irwin Road Expansion, San Bernardino County.** Linear surveys, biological assessment, and draft biological opinion for desert tortoises and sensitive plants on a 2.8 linear mile climbing lane improvement through Pickhandle Pass. Construction monitoring.

1994 **Briggs Mine Project, Inyo County.** Completed desert tortoise survey of portion of mine site and prepared summary report.

1993 **Crude Oil Pipeline Recoat Project, San Bernardino County.** Completion of pipeline preactivity survey for the desert tortoise and other sensitive species. Preparation of associated report.

1993 **Unocal Endangered Species Compliance Training Course.** Preparation of materials and presentation of an endangered species course with Unocal employees in the San Joaquin Valley. Field review to identify species, sign, and to demonstrate survey methods as well.

1993 **Wheaton and Afton Regenerator Facility Survey, San Bernardino County.** Wildlife and sensitive plant survey and report preparation of two AT&T sites in the Mojave Desert.

1993 **Hectorite Mine Tortoise Clearance Survey, San Bernardino County.** Clearance survey of approximately 150-acre mine site in the central Mojave Desert.

1993 **Crude Oil Pipeline Segment Replacement, San Bernardino County.** Endangered species survey for Four Corners Pipe Line Company and report preparation.

1993 **Morongo Canyon Washout Survey, Riverside County.** Endangered species survey of crude oil pipeline washout in the Big Morongo Canyon Area of Critical Environmental Concern. Associated report preparation and development of site protection measures.

1993 **Rand Mine Project Survey, Kern County.** Systematic inventory of 2,000+ acre large-scale gold mine operation for plants and wildlife, emphasizing the desert tortoise and Mohave ground squirrel. Conducted with a crew of 5 biologists. Preparation of biological assessment and development of associated draft State 2081 and Federal permits

1993 **Baltic Mine Project Monitoring, Kern County.** Desert tortoise compliance monitoring during site preparation of large-scale open pit gold mining operations. Completion of associated monitoring report.

1993 **Line 90 Road Maintenance Survey, San Bernardino County.** Survey of approximately 45-linear mile road alignment in the central Mojave Desert for desert tortoises and other sensitive species. Associated report preparation.

1993 **Four Corners Pipe Line Company (ARCO) Programmatic Permit, State of California.** Preparation of draft biological assessment addressing ongoing maintenance over 3,800 linear miles of crude oil lines encompassing 40% of California. Meetings with agency staffs. Ongoing project.

1993 **Northeast Bakersfield Sewer Trunkline, Kern County.** Field surveys of 13.9 mile alignment. Preparation of biological assessment and biological resources chapter for EIR.

1993 **Industrial Asphalt Quarry, San Bernardino County.** Desert tortoise surveys and report preparation. Monitoring.

1993 **Piute Tribe Project, Clark County, Nevada.** Participation in systematic desert tortoise surveys.

1993 **Oak Summit Project, San Bernardino County.** Livetrapping emphasizing the Los Angeles pocket mouse.

1993 **M.H. Whittier Lease Survey, Coalinga Oilfield, Fresno County.** Endangered Species survey and report.

1992 **Four Corners Pipe Line Maintenance, San Bernardino County.** Completion of preactivity survey of rewrap line segments for the desert tortoise. Preparation of State 2081 and draft Section 7 opinion. Monitor during project. Preparation of post-monitoring report for agencies.

1992 **Morongo Valley Pump Station, San Bernardino County.** Sensitive plant/wildlife survey. Preparation of summary report for county review.

1992 **Aerial Photoanalysis Monitoring, Fresno County.** Interpretation of pre- and post-construction photos for monitoring program on cogeneration project. Work also included San Joaquin kit fox survey of plant site. Preparation of monitoring report for submittal to agencies by company.

1992 **Gold Mining project, Kern County.** Preparation of biological assessment addressing open pit mine expansion in desert tortoise habitat.

1992 **Raptor Monitoring, SeaWest Windfarm, Kern County.** Periodic monitoring of large wind turbine project near Mojave, using standardized protocols developed by the California Energy Commission.

1992 **Portland Cement Mohave Ground squirrel Habitat Evaluation.** Evaluation of large aggregate mine site near Victorville, using CDFG protocols for habitat evaluation.

1992 **Victorville-Bakersfield Fiber-optic Line.** Assisted as project manager with surveys of 145 linear mile line for listed species with crew of 10 biologists. Meetings with agencies. Future preparation of State 2081 permit and Federal draft Section 7 opinion.

1992 **Adelanto Subdivision, San Bernardino County.** Desert tortoise/Mohave ground squirrel survey of subdivision.

1992 **I-5 Wastewater Treatment Plant, Kern County.** Preparation of state Endangered Species Management Permit.

1992 **Kern County Landfills, Kern County.** Assisted as field supervisor in T+E surveys of 15 major County landfill sites for plants and wildlife. Preparation of reports, meetings with agencies and future development of State 2081 and Federal 10(a) permits.

1992 **Lockwood Valley Subdivision, Ventura County.** Small mammal livetrapping survey, focusing on the Federal candidate Tehachapi pocket mouse.

1992 **Salt River Project, Quemado, New Mexico.** Vegetation transects for mining reclamation project.

1992 **California City Mohave Ground Squirrel Habitat Evaluation**. Evaluation using CDFG protocols for Mohave ground squirrel habitat.

1992 **Line 63 Relocation, Kern County.** Tehachapi slender salamander survey of proposed crude oil pipeline re-route south of Bakersfield.

1992 **Mountain High Water Line, Los Angeles County.** Small mammal livetrapping and plant survey of proposed 8-mile line segment.

1992 **Nipton Road Water Line, San Bernardino County.** Desert tortoise survey and monitor during construction.

1992 **Apple Valley Landfill, San Bernardino County.** Desert tortoise survey.

1992 **Griffin Subdivision, Kern County.** Preparation of draft Section 7 opinion addressing issuance of Section 10(a) permit for project.

1992 **Whitewater-Dillon Road Fiber-optic Line, Riverside County.** Sensitive species survey of 25-linear mile line.

1992 **PacBell Fiber-optic Line, Kern County.** Sensitive species survey of 2.8 linear mile line.

1992 **AT&T Road Maintenance, San Bernardino and Clark Counties.** Survey of 32-linear mile road segment and report preparation.

1992 **Ward Valley Cleanup Site, San Bernardino County.** Desert tortoise/sensitive plant survey, with report and employee training.

1992 **Barron Mine Project, Kern County**. Supplemental desert tortoise/sensitive plant survey.

1991 **Alpine Butte Subdivision, Los Angeles County.** Preparation of biota report for 160-acre subdivision.

1991 **Pipeline 63 Re-route, Kern County.** Biota survey and report for pipeline segment in Grapevine Canyon.

1991 **Four Corners Pipeline CPU Site Surveys, San Bernardino County.** Desert tortoise surveys for about 6-8 sites along a pipeline corridor in the eastern Mojave Desert.

1991 **Delano State Prison, Kern County.** Preparation for a site management and monitoring plan for endangered species.

1991 **Keene Ranch Project, Kern County.** Assistance during development of final EIR for project.

1991 **Yellow Aster Mine, Kern County.** Field surveys for desert tortoise and several expansion projects. Preparation of 2081 state Endangered Species Management Permit and draft biological opinion.

1991 **Mojave River Levee Project, San Bernardino County.** Desert tortoise survey near Barstow.

1991 **Lost Hills Wastewater Treatment Plant, Kern County.** Survey for listed wildlife and plant species.

1991 **Soda Lake Gold Processing, San Bernardino County.** Preparation of draft biological opinion for project.

1991 **Jasmin Development, Kern County.** Sensitive wildlife and plant survey of proposed 1,600-acre housing development near Bakersfield.

1991 **Excel Minerals Millsite, Kern County.** Sensitive wildlife and plant survey southwest of Bakersfield.

1991 **Van and Stowell Subdivision, Kern County.** Sensitive plant and wildlife survey near Frazier Park.

1991 **Coalinga Cogeneration Project, Fresno County.** San Joaquin kit fox survey of staging/laydown area.

1991 **M.H.Whittier Star Lease, Fresno County.** San Joaquin kit fox.sensitive plant survey of oilfield expansion project.

1991 **AT&T Repeater Hut Station, San Bernardino County.** Desert tortoise survey of 19 comm sites in the central Mojave Desert.

1991 **McGinnis Creek Timber Project, Humboldt County.** Survey for sensitive amphibians within 700-acre proposed timber harvest area.

1991 **Jess Ranch, San Bernardino County.** Habitat evaluation for the Mohave ground squirrel.

1991 **Texaco Landfill Cleanup, Kern County.** Endangered species survey of four separate landfill sites in the southwestern San Joaquin Valley.

1991 **SeaWest Wind Farm, Kern County.** Part of team undertaking raptor monitoring study of 300 turbines.

1991 **Kern River Pipeline, San Bernardino County.** Tortoise monitor during major natural gas pipeline construction project.

1991 **Granite Construction Company Quarry Site, Los Angeles County.** Wildlife and plant survey.

1991 **Whittier Station 18, Los Angeles County.** Sensitive plant and wildlife survey for the Southern California Gas Company.

1991 **Mtn High Ski Resort Pipeline, Los Angeles County.** Wildlife and plant survey and report.

1991 **Los Angeles Cellular Phone Comm Site, Riverside County.** Wildlife and plant survey and report.

1991 **Mid-set Cogeneration Pipeline, Kern County.** Survey form the San Joaquin kit fox, giant kangaroo rat and San Joaquin antelope squirrel.

1991 **Zion Lutheran Church Site, San Bernardino County.** Desert tortoise survey and report.

1991 **Open Pit Mine, Kern County.** Desert tortoise survey near Randsburg, with report.

1991 **Mine Ore Processing Site, Kern County.** Desert tortoise survey and relocation near Randsburg, with report.

1991 **PacTel Comm Sites, San Bernardino County.** Wildlife and plant surveys of 13 separate comm sites, with report.

1991 **Adair Engineering Project, Kern County.** San Joaquin kit fox and Tipton kangaroo rat study.

1991 **Mountain Mesa Kissach Property, Kern County.** General wildlife survey.

1991 **Line 90 Pipeline Project, San Bernardino County.** Desert tortoise surveys of two pipeline segments. Preparation of draft biological opinion and State 2081 permit for project.

1991 **Industrial Asphalt Project, San Bernardino County.** Desert tortoise survey.

1991 **South Needles Treatment Ponds, San Bernardino County.** Desert tortoise survey for the Southern California Gas Company.

1991 **Irvine Ranch, Orange County.** Survey of about 50,000 acres for sensitive wildlife species, emphasizing the orange-throated whiptail and San Diego horned lizard.

1991 **Mountain Investment Company Purchase, San Bernardino County.** Desert tortoise survey.

1990 **Fort Cady Mines, San Bernardino County.** Linear surveys for the desert tortoise and rare plants.

1990 **NL Hector Mines, San Bernardino County**. Linear transect surveys for desert tortoises and rare plants.

1990 **City of Barstow Landfill, San Bernardino County.** Linear transects for the desert tortoise.

1990 **Victorville Landfill, San Bernardino County.** Desert tortoise survey.

1990 **City of Lenwood Landfill, San Bernardino County.** Desert tortoise survey

1990 **Sitting Bull Developments, San Bernardino County.** Desert tortoise survey.

1990 **SeaWest Wind Energy Project, Kern County.** Project manager of team of biologists conducting survey of 1,500+ acre wind farm. Included small mammal livetrapping.

1990 **PG&E Line 300 Reinforcement**, Barstow, California
Tortoise survey of pipeline right-of-way

1990 **PG&E Line 300 Reinforcement**, Bakersfield, California
San Joaquin kit fox and blunt-nosed leopard lizard survey of pipeline right-of-way segment

1990 **DaCin Development**, Beaumont, California
Sensitive species survey and mitigation plan for proposed 450-acre land sale.

1990 **Lake Success Reservoir Enhancement**, Tulare County
Survey for San Joaquin kit fox and other listed species at reservoir site and associated Water District lands.

1990 **Lake Kaweah Reservoir Enhancement**, Tulare County
Survey for San Joaquin kit fox, blunt-nosed leopard lizard, and other listed species at reservoir site and associated Water District lands.

1990 **Carl Jones Construction Company**, Apple Valley, CA
Development of a Habitat Conservation Plan for a permit from the U.S. Fish and Wildlife Service to allow development on tortoise habitat.

1990 **Salinas River Cogeneration Project**, Monterey County
Endangered species survey of plant site and adjacent steam field service area.

1990 **Sargent Canyon Cogeneration Project**, Monterey County
Endangered species survey of plant site and adjacent steam field service area.

1990 **SoCal Gas 235 Pipeline Project**, Victorville, California
Mohave ground squirrel records search of proposed pipeline corridor, extending from Newberry to Silver Lakes area.

1990 **Texaco Refinery Sumps Cleanup**, Bakersfield, California
Survey of section of refinery for San Joaquin kit fox and other listed species.

1990 **Rancho Clarita Development**, Ventura County, California
Wildlife survey of proposed development north of Los Angeles

1990 **McMillan Canyon Road Realignment**, San Luis Obispo County
Endangered species survey of proposed highway realignment near the community of Shandon.

1990 **Gartner Subdivision**, Bakersfield, California
Endangered species survey of proposed commercial subdivision in north Bakersfield area.

1990 **Shandon Properties**, San Luis Obispo County, California
Endangered species survey of three parcels proposed for subdivision.

1990 **DeGennaro Development**, Riverside, California
Preparation of Streambed Alteration Agreement for proposed development in Riverside affecting riparian stream.

1990 **Coalinga Cogeneration Project**, Fresno County, California
Endangered species surveys and preparation of both State and Federal permits allowing for future development in endangered species habitat.

1990 **Rubidoux Sports Complex**, Riverside County, California
Wildlife and plant surveys and preparation of Streambed Alteration Agreement for proposed sports development.

1990 **George Dube Subdivision**, Phelan, California
Desert tortoise survey.

1990 **Woodridge Development**, Kern County, California
Wildlife and plant survey of proposed 2,000-unit subdivision.

1990 **Silver Lakes Development**, San Bernardino County
Desert tortoise survey.

1990 **Cushenberry Grade Sand and Gravel Quarry**, Lucerne Valley, California. Desert tortoise survey.

1990 **Excel Mineral Minesite and Millsite**, Kern County, California. Survey for San Joaquin kit foxes and other listed species.

1990 **Unocal Cleanup-Section 32G**, Kern County, California
Endangered species survey, including San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat.

1990 **Apple Valley Subdivision**, Apple Valley, California
Desert tortoise survey

1990 **Ridgecrest Golf Course**, Ridgecrest, California
Preparation of a Habitat Conservation Plan and related documents for the City addressing future development in desert tortoise habitat.

1990 **Buttonwillow Race Circuit Course**, Kern County, California
Surveys for Tipton kangaroo rats and other endangered species.

1989 **Chevron Industrial Complex**, Bakersfield, California
San Joaquin kit fox survey.

1989 **China Grade Landfill**, Bakersfield, California
Endangered species survey of proposed expansion of City landfill.

1989 **Triam Development**, Tehachapi, California. Wildlife and plant survey, focusing on sensitive species.

1989 **Salcido Construction Company Subdivision**, Tehachapi, California. Wildlife and plant survey, focusing on sensitive species.

1989 **Unocal Cleanup, NPR-2**, Kern County, California
Endangered species survey for San Joaquin kit fox, blunt-nosed leopard lizard, San Joaquin

antelope squirrel, and giant kangaroo rat.

Barrett J. Scurlock

900 E. Desert Inn Rd
Apt # 508
Las Vegas, NV 89109
(513)461-1268
ScurlockB@hotmail.com
BarrettScurlock@gmail.com

Education

Miami University
Oxford, Ohio 45056
Bachelor of Science, Major Zoology
Thematic Sequence Chemistry of Life Sciences, minor Botanical Ecology
Graduation date December 2004

Research Experience

Volunteer for Avian Research and Education Institute Spring 2003-graduation
Supervised by Dr. David Russell
- Participated in migratory bird banding program
- Duties included netting, banding, identifying, weighing, measuring, and data recording

Undergraduate Research Assistant May 2004-graduation
Miami University Department of Zoology
Supervised by Dr. Maria Gonzalez
- **Larval gizzard shad experiment**
  - Constructed mesocosm facility
  - Sampled weekly for light, nutrients, chlorophyll, oxygen, NVSS, zooplankton, and phytoplankton
- **Effects of Atrazine on zooplankton populations in Acton Lake**
  - Collected and filtered water samples
  - Sampled temperature and dissolved oxygen in water column
- **OSU Larval gizzard shad experiment**
  - Sampled shad weekly using limnological nets
- **Various others contributions to ongoing Miami University research**
  - Constructed gizzard shad pond experiment
  - Assisted in sediment trap and core collections of Acton Lake
  - Member of electro shocking crew for fish abundance of Acton Lake
  - Heading larval fish data collection
  - Assisted in collection of zebra muscle data

Student Conservation Association **2/2005- 9/2005**
-University of Nevada-Reno-Las Vegas, NV field station
Field Research Intern : tortoise research
Assist principle investigators in conducting population surveys in the Mojave Desert
Field blood sampling
In field Ultrasound
Permitted for handling wild tortoise
Radio telemetry tracking and behavior monitoring
GPS tracking
First Aid training
Desert four-wheel drive training

Towbin Dodge **10/2005-5/2006**
Consultant
Internet department manager
Responsible for educating employees on computer software
Reviewed credit applications with clients, credit counseling
Interpersonal communication and management

Nevada Biological **6/2006- 3/2008- 10/2008- present**
Biologist
Desert tortoise field biologist
Use of GPS units to mark all sign of Gopherus agasizii
Removal and relocation of all desert tortoises from hazardous areas
Mohave Desert plant and animal surveys
Rare and endemic plant surveys
Relocation of desert cacti
Daily field reports
Extensive 4-wheel drive vehicle experience
Conducted environmental compliance training to construction workers
Lead biologist on Silver Flag substation construction project with no takes
Lead biologist on HACCP 49 acre project with no takes
Personally located and saved thirty- six tortoises with Nevada Biological.

Great Basin Institute **3/2008-9/2008**
Spring Mountain National Recreation Area
Research Associate lead
Conducted avian transects for the Great Basin Bird Observatory
Supervised Forest Service Botany surveys; line transects and improvised Whitaker plots
Recorded and filed TES and EO survey forms
Daily use of GIS and Trimble GPS for mapping plant populations
Mine surveys; Botanical and Biota
Soil composition training
Alpine experience including wilderness survival training

Volunteer Experience

Las Vegas Valley Wash coordination committee
Get Outdoors Nevada restoration and hike leader
CWD, and Avian flu testing for Wyoming Fish and Game

Skills

Crew lead and project management experience
Intense desert tortoise environment experience and conditioning
Identification of tortoise sign
Field first aid, CPR, and wilderness survival training
GIS training and map making skills, arcview arcgis 9.2 course
Experience writing biological reports
Knowledge of Mohave flora and fauna valley floor to the alpine
Ability to work independently and as part of a team
Extensive experience in field and laboratory work
Ability to solve problems as they arise in an experiment
Ability to identify aquatic invertebrates, insects, fish, trees, and birds
Experience with electro fishing, zooplankton sampling, larval fish sampling, and numerous limnological sampling methods
Experience in netting, identifying, handling, weighing, measuring, and banding birds
Experience in experimental design, quality assurance, and data collection
Extensive experience operating watercraft, and four-wheel drive vehicles
GPS palm os, Trimble, Radio Telemetry, Government issued radio, Ultrasound, and GIS experience
Competent using Word, Excel, PowerPoint, on PC's and MAC's
Intermediate Spanish

References

Dr. Jim Boone
PHD Ecology
(702)-286-6477
jlboone@aol.com

Mike Ohmana
Biologist
Nevada Biological
(435)-260-1009

Marija Minic
Biologist
SNEI
(702)-528-3687

Matt Flores
Project Coordinator
Great Basin Institute
(775)-240-1736

Carrie Anderson
Southern Paiute tribe member
Monitor
Nevada Biological
(702)-480-4989

Dr. Maria J.Gonzalez
Department of Zoology
Miami University
Oxford, OH 45056
(513) 529-3189

APPENDIX 2

OBSERVED PLANT SPECIES LIST

APPENDIX 2

Vascular Plants Observed on the Palmdale Hybrid Power Plant Project Sites
Los Angeles County, California

This list reports only the plants observed on this site by this study. Other species may have been overlooked or undetectable due to their growing season. Plants were identified from keys, descriptions and drawings in Hickman (ed.) 1993. Some specimens were identified or confirmed by Andrew C. Sanders (University of California Riverside Herbarium). Unless noted otherwise, nomenclature and systematics follow Hickman (ed.) 1993.

SYMBOLS AND ABBREVIATIONS:

* Non-native (introduced) species
** Special-Status species (see text).
cf. Uncertain identification, but plant specimen "compares favorably" to named species
sp. Identified only to genus; species unknown (plural = spp.)

GYMNOSPERMS	
Cupressaceae	**Cypress Family**
Cupressus sp.	Cypress
Juniperus californica	California Juniper
Ephedraceae	**Ephedra Family**
Ephedra nevadensis	Nevada joint fir
DICOTS	
Apiaceae	**Carrot Family**
Lomatium mohavense	Mojave Lomatium
Asclepiadaceae	**Milkweed Family**
Asclepias vestita	Woolly Milkweed
Asteraceae	**Sunflower Family**
Ambrosia acanthicarpa	Annual Bursage
Ambrosia dumosa	White Bursage
Amphipappus fremontii	Chaff-bush
Anisocoma acaulis	Scale Bud
Artemisia tridentata	Big Sagebrush
Baccharis salicifolia	Mule Fat
Chaenactis fremontii	Desert Pincushion
Chrysothamnus nauseosus	Rubber Rabbitbrush
Coreopsis bigelovii	Bigelow’s Tickseed
Encelia actoni	Acton Encelia
Ericameria cooperi	Cooper’s Goldenbush
Ericameria linearifolia	Interior Goldenbush
Eriophyllum ambiguum	Beautiful Woolly Sunflower

Eriophyllum pringlei	Pringle's Woolly Sunflower
Eriophyllum wallacei	Wallace's Woolly Sunflower
Filago depressa	Dwarf Cottonrose
Gutierrezia sp.	Snakeweed, Matchweed
Hymenoclea salsola	Cheesebush
Lasthenia californica	California Goldfields
Layia glandulosa	White Layia
Layia platyglossa	Tidy-tips
Lessingia sp.	Lessingia
Malacothrix glabrata	Desert Dandelion
Nicolletia occidentalis	Mojave Hole-in-the-sand Plant
Psilostrophe cooperi	Paper-daisy
Rafinesquia neomexicana	Desert Chicory
Stephanomeria exigua	Small Wire-lettuce
Syntrichopappus fremontii	Fremont's Syntrichopappus
Tetradymia axillaris var. *longispina*	Longspine Cotton-thorn
Tetradymia glabrata	Littleleaf Cotton-thorn
Xylorhiza tortifolia var. *tortifolia*	Mojave-aster
Boraginaceae	**Borage Family**
Amsinckia menziesii var. *menziesii*	Rancher's Fireweed
Amsinckia tessellata	Devil's Lettuce
Cryptantha cf. *barbigera*	Bearded Cryptantha
Cryptantha circumscissa	Cushion Cryptantha
Cryptantha dumetorum	Bushloving Cryptantha
Cryptantha micrantha	Purple-root Cryptantha
Cryptantha sp.	Cryptantha
Pectocarya penicillata	Sleeping Combseed
Pectocarya recurvata	Curvenut Combseed
Pectocarya setosa	Moth Combseed
Plagiobothrys arizonicus	Arizona Popcornflower
Tiquilia plicata	Fanleaf Crinklemat
Brassicaceae	**Mustard Family**
**Brassica tournefortii*	Sahara Mustard
Descurainia pinnata	Western Tansy Mustard
Guillenia lasiophylla	California Mustard
**Hirschfeldia incana*	Shortpod Mustard
Lepidium flavum	Yellow Peppergrass
Lepidium fremontii	Desert Peppergrass
**Sisymbrium orientale*	Indian Hedge Mustard
Stanleya pinnata	Prince's Plume
Tropidocarpum gracile	Dobie Pod
Cactaceae	**Cactus Family**
Cylindropuntia echinocarpa	Golden Cholla
Opuntia basilaris	Beavertail Cactus
Caprifoliaceae	**Honeysuckle Family**
Sambucus mexicana	Blue Elderberry

Chenopodiaceae	**Goosefoot Family**
Atriplex canescens	Four-winged Saltbush
Atriplex phyllostegia	Arrowscale
Atriplex polycarpa	Allscale
Grayia spinosa	Spiny Hop-sage
Krascheninnikovia lanata	Winter Fat
**Salsola tragus*	Russian Thistle
Crassulaceae	**Stonecrop Family**
Dudleya saxosa	Panamint Liveforever
Cucurbitaceae	**Gourd Family**
Brandegea bigelovii	Desert Starvine
Cuscutaceae	**Dodder Family**
Cuscuta sp.	Dodder
Euphorbiaceae	**Spurge Family**
Chamaesyce albomarginata	Rattlesnake Weed
Croton californicus	California Croton
Stillingia paucidentata	Mojave Toothleaf
Fabaceae	**Legume Family**
Astragalus layneae	Layne's Milkvetch
Astragalus lentiginosus	Freckled Milkvetch
Lupinus concinnus	Bajada Lupine
Lupinus odoratus	Mojave Lupine
Senna armata	Spiny Senna
Trifolium albopurpureum	Rancheria Clover
Fagaceae	**Oak Family**
Quercus john-tuckeri	Tucker's Oak
Geraniaceae	**Geranium Family**
**Erodium cicutarium*	Red-stemmed Filaree
Hydrophyllaceae	**Waterleaf Family**
Emmenanthe penduliflora	Whispering Bells
Eriodictyon trichocalyx var. *trichocalyx*	Yerba Santa
Nama demissum	Purple Mat
Phacelia crenulata	Notch-leaved Phacelia
Phacelia distans	Wild Heliotrope
Phacelia fremontii	Fremont's Phacelia
Lamiaceae	**Mint Family**
Monardella exilis	Mojave Monardella
Salazaria mexicana	Bladder Sage
Salvia carduacea	Thistle Sage
Salvia columbariae	Chia

Salvia dorrii	Purple Sage
Loasaceae	**Loasa Family**
Mentzelia albicaulis	White Stemmed Blazing Star
Malvaceae	**Mallow Family**
Eremalche exilis	White Mallow
Sphaeralcea ambigua	Apricot Mallow
Nyctaginaceae	**Four O'Clock Family**
Abronia pogonantha	Mojave Sand Verbena
Abronia villosa	Desert Sand Verbena
Allionia incarnata	Windmills
Mirabilis bigelovii (*laevis*)	Desert Wishbone Bush
Oleaceae	**Olive Family**
Fraxinus velutina	Velvet Ash
**Olea europaea*	Olive Tree
Onagraceae	**Evening Primrose Family**
Camissonia boothii	Booth's Evening Primrose
Camissonia campestris	Mojave Sun Cup
Camissonia claviformis	Brown-eyed Primrose
Camissonia pallida	Paleyellow Sun Cup
Camissonia palmeri	Palmer Evening Primrose
Oenothera californica	California Evening Primrose
Oenothera deltoides	Devil's Lantern
Papaveraceae	**Poppy Family**
Eschscholzia californica	California Poppy
Eschscholzia minutiflora	Pygmy Poppy
Platystemon californicus	Cream Cups
Polemoniaceae	**Phlox Family**
Eriastrum densifolium	Giant Woollystar
Eriastrum sp.	Eriastrum
Gilia latiflora	Broad-flowered Gilia
Gilia sp.	Gilia
Linanthus aureus	Golden Desert-trumpets
Linanthus parryae	Parry's Linanthus
Loeseliastrum matthewsii	Desert Calico
Polygonaceae	**Buckwheat Family**
Centrostegia thurberi	Thurber's Spineflower
Chorizanthe brevicornu	Brittle Spineflower
Chorizanthe rigida	Spiny-herb
Eriogonum fasciculatum	California Buckwheat
Eriogonum inflatum	Desert Trumpet
Eriogonum cf. *maculatum*	Spotted Buckwheat
Eriogonum palmerianum	Palmer's Buckwheat

Eriogonum plumatella	Flat-topped Buckwheat
Eriogonum sp.	Buckwheat
Eriogonum cf. *viridescens*	Two-tooth Buckwheat
Oxytheca perfoliata	Roundleaf Puncturebract
Rumex hymenosepalus	Wild-rhubarb
Portulacaceae	**Purslane Family**
Calandrinia ciliata	Red Maids
Calyptridium monandrum	Sand Cress
Claytonia perfoliata	Miner's Lettuce
Rosaceae	**Rose Family**
Purshia stansburiana	Stansbury Cliffrose
Salicaceae	**Willow Family**
Populus fremontii	Fremont Cottonwood
Salix sp.	Willow
Scrophulariaceae	**Figwort Family**
Castilleja angustifolia	Desert Indian Paintbrush
Castilleja exserta	Purple Owl's-clover
Collinsia bartsiifolia	Chinese Houses
Mimulus bigelovii	Bigelow's Monkeyflower
Penstemon utahensis	Utah Penstemon
Solanaceae	**Nightshade Family**
Datura wrightii	Jimson Weed
Lycium andersonii	Anderson Box Thorn
Lycium cooperi	Cooper's Box Thorn
Tamaricaceae	**Tamarisk Family**
**Tamarix ramosissima*	Salt Cedar
Zygophyllaceae	**Caltrop Family**
Larrea tridentata	Creosote Bush
MONOCOTS	
Liliaceae	**Lily Family**
Agave sp.	Agave
Allium fimbriatum	Fringed Onion
Calochortus kennedyi	Desert Mariposa Lily
Dichelostemma capitatum	Blue Dicks
Muilla coronata	Crowned Muilla
Yucca brevifolia	Joshua Tree
Yucca schidigera	Mohave Yucca
Yucca whipplei	Our Lord's Candle
Zigadenus brevibracteatus	Desert Death Camas
Poaceae	**Grass Family**
Achnatherum hymenoides	Indian Ricegrass

Achnatherum speciosum	Desert Needlegrass
**Bromus madritensis* ssp. *rubens*	Red Brome
**Bromus tectorum*	Cheat Grass
Distichlis spicata	Saltgrass
**Hordeum murinum* ssp. *leporinum*	Hare Barley
**Schismus barbatus*	Mediterranean Grass
Vulpia octoflora	Six Weeks Fescue

APPENDIX 3

OBSERVED VEREBRATE SPECIES LIST

APPENDIX 3

Vertebrates Observed on the Palmdale Hybrid Power Plant Project Sites Los Angeles County, California

This list reports only animals or their sign observed on the site by this study. Other species may have been overlooked or undetectable due to their nocturnal, subterranean, and/or migratory activity patterns. Nomenclature and taxonomy for fauna observed on site generally follows the American Ornithologists' Union Checklist and its supplements (1998) for avifauna, and CDFG (2006) for herpetofauna and mammals.

SYMBOLS AND ABBREVIATIONS:

*	Non-native (introduced) species
**	Special-Status Species species (see text)
sp.	Identified only to genus; species unknown (plural = spp.)

REPTILIA	**REPTILES**
Iguanidae	**Iguanids**
Dipsosaurus dorsalis	Desert Iguana
Crotaphytidae	**Collared and Leopard Lizards**
Gambelia wislizenii	Long-nosed Leopard Lizard
Phrynosomatidae	**Zebra-tailed, Earless, Fringe-toed, Spiny, Tree, Side-blotched, and Horned Lizards**
Sceloporus magister	Desert Spiny Lizard
Sceloporus occidentalis	Western Fence Lizard
Uta stansburiana	Side-blotched Lizard
Phrynosoma platyrhinos	Desert Horned Lizard
Xantusiidae	**Night Lizards**
Xantusia vigilis	Desert Night Lizard
Teiidae	**Whiptails, Allies**
Aspidoscelis tigris	Western Whiptail
Colubridae	**Colubrids**
Masticophis flagellum	Coachwhip
Pituophis catenifer	Gopher Snake
Viperidae	**Vipers**
Crotalus scutulatus	Mojave Rattlesnake

AVES	**BIRDS**
Anatidae	**Ducks, Geese, Swans**
Anas platyrhynchos	Mallard
Odontophoridae	**New World Quail**
Callipepla gambelii	Gambel's quail
Callipepla californica	California Quail
Cathartidae	**New World Vultures**
Cathartes aura	Turkey Vulture
Accipitridae	**Hawks, Kites, Eagles, Allies**
***Accipter cooperii*	Cooper's Hawk
Buteo jamaicensis	Red-tailed Hawk
***Buteo regalis*	Ferruginous Hawk
Falconidae	**Caracaras, Falcons**
Falco sparverius	American Kestrel
Charadriidae	**Lapwings, Plovers**
Charadrius vociferus	Killdeer
Scolopacidae	**Sandpipers, Phalaropes, Allies**
Calidris mauri	Western Sandpiper
Gallinago delicata	Wilson's Snipe
Laridae	**Gulls, Terns, Skimmers**
Larus californicus	California Gull
Columbidae	**Pigeons, Doves**
Columba livia	Rock Pigeon
Zenaida macroura	Mourning Dove
Strigidae	**Typical Owls**
Bubo virginianus	Great Horned Owl
***Athene cunicularia*	Burrowing Owl
Caprimulgidae	**Goatsuckers**
Chordeiles acutipennis	Lesser Nighthawk
Apodidae	**Swifts**
***Chaetura vauxi*	Vaux's Swift
Trochilidae	**Hummingbirds**
Archilochus alexandri	Black-chinned Hummingbird
Calypte anna	Anna's Hummingbird

Alcedinidae	**Kingfishers**
Ceryle alcyon	Belted Kingfisher
Picidae	**Woodpeckers, Allies**
Picoides scalaris	Ladder-backed Woodpecker
Tyrannidae	**Tyrant Flycatchers**
Sayornis saya	Say's Phoebe
Myiarchus cinerascens	Ash-throated Flycatcher
Tyrannus verticalis	Western Kingbird
Laniidae	**Shrikes**
***Lanius ludovicianus*	Loggerhead Shrike
Corvidae	**Crows, Jays**
Aphelocoma californica	Western Scrub-Jay
Corvus corax	Common Raven
Alaudidae	**Larks**
Eremophila alpestris	Horned Lark
Hirundinidae	**Swallows**
Tachycineta thalassina	Violet-green Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Hirundo rustica	Barn Swallow
Remizidae	**Penduline Tits, Verdins**
Auriparus flaviceps	Verdin
Troglodytidae	**Wrens**
Thryomanes bewickii	Bewick's Wren
Campylorhynchus brunneicapillus	Cactus Wren
Salpinctes obsoletus	Rock Wren
Mimidae	**Mockingbirds, Thrashers**
Mimus polyglottos	Northern Mockingbird
Toxostoma redivivum	California Thrasher
***Toxostoma lecontei*	Le Conte's Thrasher
Sturnidae	**Starlings**
Sturnus vulgaris	European Starling
Ptilogonatidae	**Silky-flycatchers**
Phainopepla nitens	Phainopepla

Parulidae	**Wood-Warblers**
Vermivora celata	Orange-crowned Warbler
Dendroica coronata	Yellow-rumped Warbler
Dendroica occidentalis	Hermit Warbler
Wilsonia pusillla	Wilson’s Warbler
Thraupidae	**Tanagers**
Piranga ludoviciana	Western Tanager
Emberizidae	**Emberizids**
Pipilo crissalis	California Towhee
Pipilo maculates	Spotted Towhee
Spizella breweri	Brewer's Sparrow
Chondestes grammacus	Lark Sparrow
Amphispiza bilineata	Black-throated Sparrow
Amphispiza belli	Sage Sparrow
Passerculus sandwichensis	Savannah Sparrow
Zonotrichia leucophrys	White-crowned Sparrow
Cardinalidae	**Cardinals, Saltators, Allies**
Pheucticus melanocephalus	Black-headed Grosbeak
Icteridae	**Blackbirds and Allies**
Sturnella neglecta	Western Meadowlark
Agelaius phoeniceus	Red-winged Blackbird
Quiscalus mexicanus	Great-tailed Grackle
Euphagus cyanocephalus	Brewer’s Blackbird
Icterus bullockii	Bullock's Oriole
Icterus parisorum	Scott’s Oriole
Fringillidae	**Fringilline and Cardueline Finches, Allies**
Carpodacus mexicanus	House Finch
Carduelis tristis	American Goldfinch
Carduelis psaltria	Lesser Goldfinch
Passeridae	**Old World Sparrows**
Passer domesticus	House Sparrow
MAMMALIA	**MAMMALS**
Leporidae	**Rabbits, Hares**
Sylvilagus audubonii	Desert Cottontail
Lepus californicus	Black-tailed Jackrabbit
Sciuridae	**Squirrels**
Ammospermophilus leucurus	White-tailed Antelope Squirrel
Spermophilus beecheyi	California Ground Squirrel

Muridae	**Rats, Mice, Voles**
Neotoma lepida	Desert Woodrat
Canidae	**Wolves, Foxes, Coyote**
Canis familiaris	Domestic Dog
Canis latrans	Coyote
Vulpes macrotis	Kit Fox
Felidae	**Cats**
Lynx rufus	Bobcat
Bovidae	**Goats, Sheep, Cattle**
Ovis aries	Domestic Sheep

APPENDIX 4

2009 DESERT TOROISE SURVEY FORMS

January 1992

(place a 4 X 6 photograph showing the area where the transect was conducted)

Date M/D/Y 4/7/09
Transect No. Pole 93-124
State CA
County LA
City Palmdale
Recorder Amalong
Address
Project Name PHPP
Type of Project

Quad Name
Scale
Site Name Trans. Line Seg. 1
T R Sec 0
¼ Sec ¼¼ Sec
UTM Zone
Northing
Easting
Parcel No.

If no tortoise sign occurs on the project site or Zone of Influence, the summary form should be completed. Please fill in all sections on the top 2/3 of the page of the summary form.

SUMMARY FORM
FOR PRESENCE-OR-ABSENCE AND CLEARANCE SURVEYS
FOR DESERT TORTOISE SIGN

% Slope: high ____ low ____ Aspect ____ Elevation ____ ft.
Land Form (e.g., mesa, bajada, wash) ____
Soils ____
Vegetation: dominant perennials Larrea, JT, saltbush
other species ____
dominant annuals Amsinckia, Erodium
other species rabbitbrush
Adjacent Land Use: immediate LAWA land fenced off, residential
Within 1 mi. Agriculture, open desert
Soils ____
Vegetation ____

Weather: Temperature - Air at 5 cm 70 °F Surface 70 °F Cloud cover 0 %
Wind speed 0-10 Rainfall 0 in. Rainfall in last 30 days 0.15 in.

TOTAL NUMBER OF

Corrected Sign	Live Tortoises Adult/Juv.	Shelter Sites Pallet/Burrow/Den Active/Inactive[1]	Scats[2]	Shell Remains[3]
0	A= 0 J= 0	0	M= 0 F= 0 Unk= 0	A=0 J=0 Unk=0

Tracks	Eggshell Fragments	Drinking Sites	Courtship Rings	Other	Neotoma Middens w/sign	:w/o sign
0	0	0	0	0	0	0

SIGNS OF HUMAN DISTURBANCE - NUMBER AND TYPES SEEN

Tire Tracks	Human Footprints	Dog Sign	Trash	Dump Sites	Shotgun/ Rifle Shells	Blading	Ravens	Other
✓	✓	✓	✓	0	✓	✓	✓	0

January 1992

(place a 4 X 6 photograph showing the area where the transect was conducted)

M/D/Y
Date 4/6/09
Transect No: Poles 191-199
State CA
County LA
City Palmdale
Recorder Amalong
Address
Project Name PHPP
Type of Project

Quad Name
Scale
Site Name Trans. line Segment
T_____ R_____ Sec_____
¼ Sec_____ ¼¼ Sec_____
UTM Zone
Northing
Easting
Parcel No.

If no tortoise sign occurs on the project site or Zone of Influence, the summary form should be completed. Please fill in all sections on the top 2/3 of the page of the summary form.

SUMMARY FORM
FOR PRESENCE-OR-ABSENCE AND CLEARANCE SURVEYS
FOR DESERT TORTOISE SIGN

% Slope: high_____ low_____ Aspect_____ Elevation_____ft.
Land Form (e.g., mesa, bajada, wash)
Soils
Vegetation: dominant perennials Larrea tridentata
other species
dominant annuals Linanthus parryae, Lasthenia californica
other species
Adjacent Land Use: immediate Transmission line corridor
Within 1 mi. Urban
Soils
Vegetation

Weather: Temperature - Air at 5 cm 70 °F Surface 70 °F Cloud cover 0 %
Wind speed 0 Rainfall 0 in. Rainfall in last 30 days 0.15 in.

TOTAL NUMBER OF

Corrected Sign	Live Tortoises Adult/Juv.	Shelter Sites Pallet/Burrow/Den Active/Inactive [1]	Scats [2]	Shell Remains [3]
0	A= 0 J= 0	0	M= 0 F= 0 Unk= 0	A= 0 J= 0 Unk= 0

Tracks	Eggshell Fragments	Drinking Sites	Courtship Rings	Other	Neotoma Middens w/sign	:w/o sign
0	0	0	0	0	0	0

SIGNS OF HUMAN DISTURBANCE - NUMBER AND TYPES SEEN

Tire Tracks	Human Footprints	Dog Sign	Trash	Dump Sites	Shotgun/ Rifle Shells	Blading	Ravens	Other
0	0	0	0	0	0	0	✓	0

January 1992

(place a 4 X 6 photograph showing the area where the transect was conducted)

Date M/D/Y 4/6/09
Transect No. Poles 110-121
State CA
County Los Angeles
City Palmdale
Recorder Amalong
Address
Project Name PHPP
Type of Project Hybrid Power Plant
Quad Name
Scale
Site Name Trans. line Segment 2
T ____ R ____ Sec ____
¼ Sec ____ ¼¼ Sec ____
UTM Zone
Northing
Easting
Parcel No.

If no tortoise sign occurs on the project site or Zone of Influence, the summary form should be completed. Please fill in all sections on the top 2/3 of the page of the summary form.

SUMMARY FORM
FOR PRESENCE-OR-ABSENCE AND CLEARANCE SURVEYS
FOR DESERT TORTOISE SIGN

% Slope: high ____ low ____ Aspect ____ Elevation ____ ft.
Land Form (e.g., mesa, bajada, wash)
Soils
Vegetation: dominant perennials CA Juniper, JT
other species Goldenbush
dominant annuals Amsinckia, goldfields, bluedicks
other species Chaenactis, Layia, Erodium
Adjacent Land Use: immediate Transmission Line Corridor, Vincent substation, Hwy 14
Within 1 mi. same as immediate
Soils
Vegetation

Weather: Temperature - Air at 5 cm 70 °F Surface 70 °F Cloud cover 0 %
Wind speed 0 Rainfall 0 in. Rainfall in last 30 days 0.15 in.

TOTAL NUMBER OF

Corrected Sign	Live Tortoises Adult/Juv.	Shelter Sites Pallet/Burrow/Den Active/Inactive[1]	Scats[2]	Shell Remains[3]
0	A= 0 J= 0	0		A= 0 J= 0 Unk= 0 M= 0 F= 0 Unk= 0

Tracks	Eggshell Fragments	Drinking Sites	Courtship Rings	Other	Neotoma Middens w/sign	:w/o sign
0	0	0	0	0	0	6

SIGNS OF HUMAN DISTURBANCE - NUMBER AND TYPES SEEN

Tire Tracks	Human Footprints	Dog Sign	Trash	Dump Sites	Shotgun/ Rifle Shells	Blading	Ravens	Other
0	0	0	✓	0	✓	✓	✓	0

Data Request 156:

Please provide a Phase I ESA for the new Sanitary Sewer Pipeline route.

Response:

Subsequent to the performance of a Phase I Environmental Site Assessment (ESA) of the proposed PHPP natural gas, reclaimed water, potable water, and sanitary wastewater linears, the Applicant had determined that relocation of the sanitary wastewater line would better serve the overall project goals. The original route of the sanitary wastewater pipeline was proposed to exit the PHPP site and proceed north approximately one mile along 15th Street East and connect to the sanitary wastewater main along East Avenue L. The realignment proposes the sanitary wastewater pipeline to exit the PHPP site and proceed approximately one mile east along East Avenue M to an interconnect point at the intersection with 25th Street East. This realignment was identified in the Supplemental Responses filed with the California Energy Commission (CEC) on March 2, 2009 and as a result, Staff submitted this Data Request.

The Applicant informed CEC Staff that the relocated sanitary wastewater pipeline alignment mirrored the first mile of the proposed transmission line alignment along East Avenue M. As such, Applicant proposed that the relocated sanitary wastewater line be addressed similarly to the environmental review for the transmission line. On April 22, 2009, CEC Staff agreed to the Applicant's proposal to handling the new sanitary wastewater pipeline relocation in the same fashion as the transmission line.

Based on this concurrence, an Environmental Data Resources (EDR) review was conducted applying the same data as were used for the transmission line search. This review of the sanitary wastewater pipeline route was conducted in an attempt to identify known historical discharges or releases of hazardous materials or wastes in the vicinity of the proposed sanitary wastewater pipeline. In the event such a discharge or release was identified, further action would be taken in accordance with the proposed Conditions of Certification identified in the Applicant's February 27, 2009 correspondence with CEC Staff.

Findings

The PHPP sanitary wastewater pipeline route will proceed for approximately one mile east along the south side of East Avenue M to its interconnection point. It is proposed to be constructed in existing street right-of-way (ROW). North of East Avenue M is primarily undeveloped land while to the south for its entire proposed length is the Air Force Plant 42 facility.

A review of the EDR database report originally prepared for the transmission line research was conducted the week of April 20, 2009. The maps, which covered the proposed transmission linear, also covered the relocated sanitary wastewater pipeline. The site identified in the EDR report is described in more detail below.

- **Air Force Plant 42** - The site is located south of the proposed sanitary wastewater pipeline along East Avenue M. The site is listed on the CERCLIS, FINDS, RCRA-LQG, ERNS, Cortese, leaking underground storage tank (LUST), HAZNET, UST listings, FTTS, EMI, WMUDS/SWAT, and Military Cleanup Site (MCS) databases. The site was not identified on the National Priority List database; however, it was listed as a high priority for further assessment under the CERCLIS listing. No outstanding violations were found regarding the RCRA generator listing. The ERNS database indicates a spill of hydrazine during U-2 aircraft maintenance. The Cortese database is listed in association with the LUST case listings. There are several LUST cases identified at the Air Force Plant 42 site, all of which were releases impacting the soil only. The site is listed as a hazardous waste generator with former/current underground storage tanks. The FTTS database indicates Polychlorinated Biphynels (PCB) investigations. The EMI database indicated emissions of total organic hydrocarbon gases, reactive organic gases, carbon monoxide, oxides of nitrogen, oxides of sulfur, particulate matter, and particulate matter 10 micrometers and smaller. The WMUDS/SWAT database indicated the site as a waste discharge system/database. The MCS database indicated approximately 20 listings including closed and open cases. The triangular icons on the focus maps that correspond to the reportable events are shown as being on or adjacent to East Avenue M along the northern border of Air Force Plant 42. It is unlikely that the reportable events actually occurred on the street since many refer to tanks or structures on the facility. It is more likely that the icons were placed to correspond to a possible street address and the actual events occurred on the facility proper. This is also true for the remainder of the facilities where the icon is placed in or adjacent to the roadway.

The proposed sanitary wastewater pipeline will be constructed in the street ROW and as such be outside the Air Force Plant 42 property. In addition, the pipeline will be placed in a trench likely not to exceed 10 feet in depth and the excavations will be localized. It should be noted that AECOM has conducted several other assessments (full Phase I ESA of PHPP site, full Phase I ESA of pipeline linears, and EDR review and analysis of transmission line route) regarding the surrounding areas, including in-depth analysis of environmental concerns located on the Air Force Plant 42 site. This assessment, along with support from previous assessments conducted by AECOM, indicated that Air Force Plant 42 is not expected to have impacted the proposed sanitary wastewater route.

No site identified on the orphan summaries were noted to be of concern along the proposed transmission pipeline route, based on the non-contamination related nature of the database listing, determined distance from the transmission pipeline linear, and/or status of the database listings (e.g., closed case status). As such, the EDR review has not identified any historical spills or releases of hazardous materials or wastes that would present a risk to pipeline workers and/or the public or negatively impact transmission line construction.

A copy of the EDR report was provided to the CEC as Attachment DR-86 in electronic format (i.e., an enclosed CD) included in the *Supplemental Data Responses # 3 to CEC Data Requests Set 1 and Responses to CEC Data Request Set 2, #147 & #155*, dated April 9, 2009.

Data Request 147:

Please provide a CD or DVD copy of the plume modeling input files (including meteorological data files), output files, and as applicable the freeware executable files that were used to complete the applicant's visible plume modeling analysis. This should include all of the SACTI and the AERMOD/VISDET files used for the cooling tower and gas turbine plume analyses, respectively.

Response:

In the interest of time and to avoid delays in the permitting process, a CD copy of the plume modeling input files (including meteorological data files), output files, and the executable files that were used to complete the PHPP visible plume modeling analysis, including all of the SACTI and AERMOD/VISDET files used for the cooling tower and gas turbine plume analyses, were filed electronically and submitted to the California Energy Commission (CEC) in the Supplement #3 to Data Request Set 1 on April 9, 2009.

Data Request 148:

a. Please describe how duct firing is planned to be used considering the variability of solar generation. While 2,000 hours of duct firing is specified on page 5.2-48 of the AFC it is unclear when duct firing will be used.

b. Address whether duct firing would be used to supplement when solar is not a full capacity would be or whether the steam turbine capacity such that duct firing can also be used for peaking power regardless of solar output.

Response:

a. Duct firing will be used when the dispatched load exceeds the capacity of the base load plant and the capacity of the solar input. Duct firing will not be used when the dispatched load is less than the capacity of the base load plant with solar input.

b. Whenever solar input is available (even in small amounts), we will use the solar output as much as is practical to meet the dispatch demand. The plant can reach peak capacity on duct firing alone or on a combination of duct firing with available solar input.

Data Request 149:

Please describe what time of day and time of year that the duct burners would be most likely to operate.

Response:

The duct burners would most likely operate during summer daytime peaking events when the dispatched load exceeds the capacity of the base load plant with solar input.

Data Request 150:

Please summarize for the gas turbine/HRSGs the exhaust conditions to complete the table, and additional data as necessary for staff to be able to determine how the gas turbine/HRSG operating conditions will vary with solar generation. Additional combinations of temperature and relative humidity, if provided by the applicant, will be used to more accurately represent the gas turbine/HRSG exhaust conditions.

Response:

Table 27 in Appendix G.3 of the AFC gave the exhaust conditions for 80 different cases of combinations of temperature, load and operating conditions. These data have been used to complete the requested table below.

Parameter	**Gas Turbine/HRSG Exhausts (each)**					
Stack Height*	44.20 meters (145 feet)					
Stack Diameter*	5.49 meters (18 feet)					
Stack Separation*	41.00 meters (135 feet)					
Ambient Temperature*	23°F		64°F		98°F	
Ambient Relative Humidity	92%		40%		17%	
Evaporative Cooler, 85% Effective	Off		On		On	
Solar On/Off	Solar On					
Case	PB-11	PB-6	PB-13	PB-8	PB-14	PB-9
Duct Firing	Yes	No	Yes	No	Yes	No
Exhaust Temperature (°F)	172.9	176.5	174.1	177.7	174.8	177.0
Exhaust Flow Rate (1,000 lbs/hr)	3,753	3,748	3,549	3,544	3,407	3,401
Exhaust Moisture Content (volume %)	8.14	7.68	8.93	8.43	9.65	9.12
Solar On/Off	Solar Off					
Case	PB-16	PB-1	PB-18	PB-3	PB-19	PB-4
Duct Firing	Yes	No	Yes	No	Yes	No
Exhaust Temperature (°F)	177.0	191.3	176.1	190.6	176.6	191.7
Exhaust Flow Rate (1,000 lbs/hr)	3,767	3,748	3,564	3,544	3,422	3,401
Exhaust Moisture Content (volume %)	9.31	7.68	10.21	8.43	11.06	9.12

*Ambient conditions are based on three of the five cases provided in Appendix G.3 of the AFC. Stack height and diameter are from page 5.2-60 of the AFC, and the stack separation is estimated from figure 2-5 of the AFC. Various available exhaust condition data are from the heat and mass balance figures in Section 2 of the AFC.

Data Request 151:

Please describe the daily profile and the seasonal heat rejection profile for the cooling tower.

Response:

Please see the table below for the daily load profile and seasonal heat rejection profile of the PHPP cooling tower.

	Daily Min.	Fired No Solar	Daily max.	Fired With Solar	Daily Mean	Fired With Solar
	Night	Heat rejection	Day	Heat rejection		Heat rejection
	Deg F	MW	Deg F	MW	Deg F	MW
Jan	34.3	462.4	58.8	480.0	46.6	482.4
Feb	37.3	462.3	63.2	479.2	50.3	481.7
Mar	40.5	462.1	67.8	483.7	54.2	480.9
Apr	45	461.9	74.8	483.0	59.9	479.8
May	52.5	461.6	82.5	482.4	67.5	483.7
Jun	59.8	461.2	91.6	481.6	75.7	483.0
Jul	65.9	467.2	97.5	481.0	81.7	482.4
Aug	65	467.1	97	481.1	81	482.5
Sep	59.2	461.2	91.1	481.6	75.2	483.0
Oct	49.5	461.7	80.4	482.6	65	483.9
Nov	39.3	462.2	67	483.7	53.2	481.1
Dec	33.3	462.5	58.6	480.1	46	482.5

- The heat rejection loads are interpolated from the data shown in the Data Request 150.
- The Daily Min, Max, and Mean Temperatures are from National Oceanic & Atmospheric Administration data for 1971 - 2000. They are simple arithmetic averages computed by summing the monthly values and dividing by thirty.
- The heat rejection loads shown are approximately +/-5% for any given day due to ambient variability. Operation when averaged over time should conform closely to the values above.

Climatological data for the City of Palmdale used in generating the above table is provided as DR-151 at the end of this section.

Data Request 152:

Please summarize for the cooling tower the conditions that affect vapor plume formation including cooling tower heat rejection, exhaust temperature, and exhaust mass flow rate. Please provide values to complete the table, and additional data as necessary for staff to be able to determine how the heat rejection load varies with ambient conditions and also determine at what ambient conditions cooling tower cells may be shut down.

Additional combinations of temperature and relative humidity or curves showing heat rejection vs. ambient condition and solar condition, if provided by the applicant, will be used to more accurately represent the cooling tower exhaust conditions. Please include appropriate design safety margins for the heat rejection, exhaust flow rate and exhaust temperature in consideration that the air flow per heat rejection ratio is often used as Condition of Certification confirmation of design limit.

Response:

The Applicant assumes a certain amount of tower exhaust recirculating to the tower inlet. This recirculation assumption results in the difference between the Ambient Wet Bulb and the Cooling Tower Inlet Plane Wet Bulb. For operational safety margin for 105 percent heat duty or 95 percent air flow use the exhaust temperature shown.

Parameter	**Cooling Tower Exhaust**					
Number of Cells	10 cells (Inline)					
Cell Height*	46.84					
Cell Diameter*	48.67					
Tower Housing Length	481 feet					
Tower Housing Width	56 feet					
Ambient Temperature*	23°F		64°F		98°F	
Ambient Relative Humidity	92%		40%		17%	
Ambient Wet Bulb	22.40		51.00		65.90	
Tower Inlet Plane Wet Bulb	22.63		52.85		67.70	
Solar On/Off	Solar On					
Case	PB-11	PB-6	PB-13	PB-8	PB-14	PB-9
Duct Firing	Yes	No	Yes	No	Yes	No
Number of Cells in Operation	10	10	10	10	10	10
Heat Rejection (MW/hr)	495	457	488	449	485	445
Exhaust Temperature (°F)	72.2	69.4	86.2	84.1	94.2	92.5
Exhaust Temperature (°F) at 105% Heat Duty or 95% Exhaust Flow	73.9	71.1	87.4	85.3	95.3	93.5
Exhaust Flow Rate (Kg/Sec)	7681.2	7728.4	7438.1	7474.1	7294.7	7326.1
Solar On/Off	Solar Off					
Case	PB-16	PB-1	PB-18	PB-3	PB-19	PB-4
Duct Firing	Yes	No	Yes	No	Yes	No
Number of Cells in Operation	10	8	10	10	10	10

Heat Rejection (MW/hr)	465	333	463	326	468.2	322
Exhaust Temperature (°F)	70.1	66.4	84.9	77.2	93.5	86.8
Exhaust Temperature (°F) at 105% Heat Duty or 95% Exhaust Flow	71.7	68.0	86.1	78.2	94.5	87.6
Exhaust Flow Rate (Kg/sec)	7718.0	6224	7460.6	7594.7	7307.7	7427.7

Heat rejection values provided, neglecting water makeup and blowdown.

Data Request 153:

Please provide the cooling tower manufacturer and model number information and a fogging frequency curve from the cooling tower vendor, if available, that corresponds to the altitude of the project site.

Response:

The cooling tower design is based on an SPX/Marley F4910-5.3-10B cooling tower. The Fogging Frequency Curve is provided as Attachment DR-153 at the end of this section.

Data Request 154:

Please confirm that the cooling tower fan motors will not have variable speed/flow controllers.

Response:

The Applicant confirms that it currently is not planned that the cooling tower fan motors will be designed with variable speed/flow controllers.

Data Request 155:

Please provide a CD or DVD copy of the gas turbine/HRSG thermal plume modeling input files (including meteorological data files), output files, and as applicable any freeware executable files that were used to complete the applicant's gas turbine/HRSG thermal plume modeling analysis.

Response:

See response to Data Request 147. In the interest of time and to avoid delays in the permitting process, a CD copy of the gas turbine/HRSG thermal plume modeling input files (including meteorological data files), output files, and executable files that were used to complete the PHPP gas turbine/HRSG thermal plume modeling analysis, were filed electronically and submitted to the CEC in the Supplement #3 to Data Request Set 1 on April 9, 2009.

Visual Resources

Attachment DR-151

Palmdale Climate Data

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

Climatography of the United States No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: PALMDALE (LANCASTER), CA **COOP ID: 046624**

Climate Division: CA 7 **NWS Call Sign:** **Elevation: 2,596 Feet** **Lat: 34˚35N** **Lon: 118˚06W**

Temperature (˚F)

	Mean (1)			Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
Month	Daily Max	Daily Min	Mean	Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Heating	Cooling	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	58.8	34.3	46.6	81+	1948	24	51.2	2000	6	1963	13	41.7	1979	573	0	.0	.0	27.2	.0	15.5	.0
Feb	63.2	37.3	50.3	84	1999	28	56.3	1995	15	1979	4	45.4	1979	413	0	.0	.0	26.7	.1	8.5	.0
Mar	67.8	40.5	54.2	91	1997	20	61.7	1972	14	1971	2	47.7	1973	353	16	.0	.1	30.6	.0	4.7	.0
Apr	74.8	45.0	59.9	98+	1996	26	68.5	1989	20	1971	23	52.0	1975	214	62	.0	2.2	29.9	.0	1.3	.0
May	82.5	52.5	67.5	107	1950	31	75.2	1997	28	1988	1	59.6	1998	85	163	.5	7.9	31.0	.0	.1	.0
Jun	91.6	59.8	75.7	112+	1994	28	79.7	1985	35	1967	2	70.0	1998	6	326	5.1	19.1	30.0	.0	.0	.0
Jul	97.5	65.9	81.7	113+	1972	14	85.6	1996	43	1948	5	76.5	1983	0	518	12.4	28.0	31.0	.0	.0	.0
Aug	97.0	65.0	81.0	112+	1997	6	84.9	1986	38+	1954	27	76.1	1976	0	496	11.2	27.5	31.0	.0	.0	.0
Sep	91.1	59.2	75.2	111	1950	2	79.7	1974	34	1978	20	68.5	1986	7	312	3.6	19.2	30.0	.0	.0	.0
Oct	80.4	49.5	65.0	105	1980	5	71.1	1988	23	1971	30	59.8	1981	103	101	.2	5.2	31.0	.0	.5	.0
Nov	67.0	39.3	53.2	93	1970	1	60.7	1995	14	1964	19	47.9	1994	360	4	.0	.0	29.7	.0	7.9	.0
Dec	58.6	33.3	46.0	84	1958	4	52.7	1977	9	1971	15	39.8	1984	590	0	.0	.0	27.3	.1	17.3	.0
Ann	77.5	48.5	63.0	113+	Jul 1972	14	85.6	Jul 1996	6	Jan 1963	13	39.8	Dec 1984	2704	1998	33.0	109.2	355.4	.2	55.8	.0

+ Also occurred on an earlier date(s)

@ Denotes mean number of days greater than 0 but less than .05

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1931-2001

(3) Derived from 1971-2000 serially complete daily data

Issue Date: February 2004

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

Climatography of the United States No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: PALMDALE (LANCASTER), CA **COOP ID: 046624**

Climate Division: CA 7 **NWS Call Sign:** **Elevation: 2,596 Feet** **Lat: 34˚35N** **Lon: 118˚06W**

Precipitation (inches)

	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	1.56	.96	2.44	1952	18	7.50	1993	.00+	1986	5.0	3.2	1.1	.3	.00	.00	.10	.32	.58	.91	1.32	1.87	2.66	4.01	5.39
Feb	1.69	1.05	2.43	1944	22	6.42	1980	.00+	1985	4.6	3.0	1.1	.6	.00	.00	.12	.32	.58	.93	1.37	1.97	2.85	4.40	6.01
Mar	1.39	.90	2.39	1938	3	5.22	1983	.00+	1997	4.8	3.1	1.0	.2	.00	.00	.18	.39	.63	.91	1.26	1.70	2.32	3.40	4.47
Apr	.33	.09	1.00	1982	1	2.47	1982	.00+	1996	1.8	.8	.2	@	.00	.00	.00	.00	.02	.09	.20	.34	.57	.98	1.41
May	.16	.00	1.10	1977	8	1.66	1977	.00+	2000	.9	.5	.1	@	.00	.00	.00	.00	.00	.00	.02	.11	.27	.56	.86
Jun	.06	.00	.60	1987	6	.71	1987	.00+	2000	.4	.2	@	.0	.00	.00	.00	.00	.00	.00	.00	.00	.06	.21	.38
Jul	.06	.00	.38	1984	31	.57	1999	.00+	2000	.5	.2	.0	.0	.00	.00	.00	.00	.00	.00	.00	.00	.07	.22	.37
Aug	.13	.00	1.46	1968	7	1.25	1977	.00+	1999	.8	.4	.1	@	.00	.00	.00	.00	.00	.00	.03	.09	.21	.42	.64
Sep	.22	.00	1.63	1976	10	2.12	1976	.00+	2000	1.1	.5	.1	@	.00	.00	.00	.00	.00	.00	.00	.12	.34	.76	1.20
Oct	.24	.04	1.63	1934	18	2.05	1987	.00+	1999	1.2	.6	.1	@	.00	.00	.00	.00	.00	.03	.10	.21	.40	.76	1.15
Nov	.43	.22	1.89	1965	22	2.01	1982	.00+	2000	2.1	1.3	.2	.0	.00	.00	.00	.02	.09	.19	.32	.50	.76	1.22	1.69
Dec	1.09	.71	3.43	1943	11	5.27	1984	.00+	2000	3.1	2.0	.8	.3	.00	.00	.02	.13	.30	.53	.83	1.25	1.86	2.94	4.08
Ann	7.36	6.54	3.43	Dec 1943	11	7.50	Jan 1993	.00+	Dec 2000	26.3	15.8	4.8	1.4	1.85	2.54	3.61	4.56	5.50	6.49	7.60	8.91	10.62	13.33	15.88

+ Also occurred on an earlier date(s)
# Denotes amounts of a trace
@ Denotes mean number of days greater than 0 but less than .05
****** Statistics not computed because less than six years out of thirty had measurable precipitation

(1) From the 1971-2000 Monthly Normals
(2) Derived from station's available digital record: 1931-2001
(3) Derived from 1971-2000 serially complete daily data
Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Services

Climatography of the United States No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: PALMDALE (LANCASTER), CA **COOP ID: 046624**

Climate Division: CA 7 **NWS Call Sign:** **Elevation: 2,596 Feet** **Lat: 34°35N** **Lon: 118°06W**

Snow (inches)

	Snow Totals														Mean Number of Days (1)								
	Means/Medians (1)				Extremes (2)										Snow Fall >= Thresholds					Snow Depth >= Thresholds			
Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	.9	.0	0	0	16.0	1974	5	19.0	1974	16	1974	5	1	1974	.1	.1	.1	@	@	@	@	@	@
Feb	.0	.0	#	0	.0	0	0	.0	0	#	1996	25	#	1996	.0	.0	.0	.0	.0	.0	.0	.0	.0
Mar	#	.0	#	0	#	1976	3	#	1976	#	1976	3	#	1976	.0	.0	.0	.0	.0	.0	.0	.0	.0
Apr	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	.9	.0	N/A	N/A	16.0	Jan 1974	5	19.0	Jan 1974	16	Jan 1974	5	1	Jan 1974	.1	.1	.1	@	@	@	@	@	@

\+ Also occurred on an earlier date(s) #Denotes trace amounts

@ Denotes mean number of days greater than 0 but less than .05

-9/-9.9 represents missing values
Annual statistics for Mean/Median snow depths are not appropriate

(1) Derived from Snow Climatology and 1971-2000 daily data

(2) Derived from 1971-2000 daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

Climatography of the United States No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: PALMDALE (LANCASTER), CA **COOP ID: 046624**

Climate Division: CA 7 **NWS Call Sign:** **Elevation: 2,596 Feet** **Lat: 34˚35N** **Lon: 118˚06W**

Freeze Data

Spring Freeze Dates (Month/Day)

Temp (F)	Probability of later date in spring (thru Jul 31) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	5/16	5/07	4/30	4/24	4/18	4/13	4/07	3/31	3/21
32	5/02	4/22	4/15	4/09	4/03	3/28	3/22	3/15	3/05
28	4/06	3/24	3/15	3/07	2/27	2/20	2/11	2/02	1/20
24	3/13	2/26	2/16	2/07	1/30	1/21	1/12	1/01	12/14
20	2/18	2/02	1/20	1/07	12/23	11/27	0/00	0/00	0/00
16	1/30	1/09	12/19	0/00	0/00	0/00	0/00	0/00	0/00

Fall Freeze Dates (Month/Day)

Temp (F)	Probability of earlier date in fall (beginning Aug 1) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	10/07	10/14	10/18	10/22	10/26	10/30	11/03	11/07	11/14
32	10/22	10/28	11/01	11/05	11/09	11/12	11/16	11/20	11/26
28	11/05	11/11	11/15	11/18	11/22	11/25	11/29	12/03	12/09
24	11/14	11/23	11/30	12/06	12/11	12/17	12/23	12/31	1/15
20	12/02	12/13	12/22	12/30	1/10	0/00	0/00	0/00	0/00
16	12/10	12/24	1/09	0/00	0/00	0/00	0/00	0/00	0/00

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	229	216	206	198	190	182	174	164	151
32	255	242	233	226	219	212	204	195	183
28	309	294	284	275	267	259	250	240	225
24	>365	365	338	323	312	301	290	277	260
20	>365	>365	>365	>365	>365	>365	>365	326	296
16	>365	>365	>365	>365	>365	>365	>365	>365	329

***** Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

0/00 Indicates that the probability of occurrence of threshold temperature is less than the indicated probability.

Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

Climatography of the United States No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: PALMDALE (LANCASTER), CA **COOP ID: 046624**

Climate Division: CA 7 **NWS Call Sign:** **Elevation: 2,596 Feet** **Lat: 34˚35N** **Lon: 118˚06W**

Degree Days to Selected Base Temperatures (˚F)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	573	413	353	214	85	6	0	0	7	103	360	590	2704
60	418	276	226	128	36	1	0	0	1	42	228	439	1795
57	331	200	165	86	19	0	0	0	0	21	161	353	1336
55	273	153	131	63	12	0	0	0	0	12	123	298	1065
50	151	66	60	25	3	0	0	0	0	2	54	179	540
32	1	0	0	0	0	0	0	0	0	0	0	5	6

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	451	511	685	838	1101	1310	1541	1519	1295	1022	635	438	11346
55	11	20	103	211	400	620	828	806	605	320	68	18	4010
57	6	11	76	174	345	560	766	744	545	267	46	11	3551
60	0	3	44	126	269	471	673	651	456	196	23	4	2916
65	0	0	16	62	163	326	518	496	312	101	4	0	1998
70	0	0	4	25	84	197	364	342	184	42	0	0	1242

Growing Degree Units (2)

Base	Growing Degree Units (Monthly)												Growing Degree Units (Accumulated Monthly)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	207	299	433	588	839	1055	1275	1258	1038	754	383	199	207	506	939	1527	2366	3421	4696	5954	6992	7746	8129	8328
45	97	172	281	438	684	905	1120	1103	888	600	246	87	97	269	550	988	1672	2577	3697	4800	5688	6288	6534	6621
50	34	72	156	297	529	755	965	948	738	448	132	28	34	106	262	559	1088	1843	2808	3756	4494	4942	5074	5102
55	0	17	64	175	378	605	810	793	589	306	55	0	0	17	81	256	634	1239	2049	2842	3431	3737	3792	3792
60	0	0	19	85	240	456	655	638	440	174	11	0	0	0	19	104	344	800	1455	2093	2533	2707	2718	2718
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	153	207	287	383	526	656	787	773	650	487	266	153	153	360	647	1030	1556	2212	2999	3772	4422	4909	5175	5328

(1) Derived from the 1971-2000 Monthly Normals
(2) Derived from 1971-2000 serially complete daily data
Note: For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Notes

a. The monthly means are simple arithmetic averages computed by summing the monthly values for the period 1971-2000 and dividing by thirty. Prior to averaging, the data are adjusted if necessary to compensate for data quality issues, station moves or changes in station reporting practices. Missing months are replaced by estimates based on neighboring stations.

b. The median is defined as the middle value in an ordered set of values. The median is being provided for the snow and precipitation elements because the mean can be a misleading value for precipitation normals.

c. Only observed validated values were used to select the extreme daily values.

d. Extreme monthly temperature/precipitation means were selected from the monthly normals data. Monthly snow extremes were calculated from daily values quality controlled to be consistent with the Snow Climatology.

e. Degree Days were derived using the same techniques as the 1971-2000 normals. Compete documentation for the 1971-2000 Normals is available on the internet from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

f. Mean "number of days statistics" for temperature and precipitation were calculated from a serially complete daily data set . Documentation of the serially complete data set is available from the link below:

g. Snowfall and snow depth statistics were derived from the Snow Climatology. Documentation for the Snow Climatology project is available from the link under references.

Data Sources for Tables

Several different data sources were used to create the Clim20 climate summaries. In some cases the daily extremes appear inconsistent with the monthly extremes and or the mean number of days statistics. For example, a high daily extreme value may not be reflected in the highest monthly value or the mean number of days threshold that is less than and equal to the extreme value. Some of these difference are caused by different periods of record. Daily extremes are derived from the station's entire period of record while the serial data and normals data were are for the 1971-2000 period. Therefore extremes observed before 1971 would not be included in the 1971-2000 normals or the 1971-2000 serial daily data set. Inconsistencies can also occur when monthly values are adjusted to reflect the current observing conditions or were replaced during the 1971-2000 Monthly Normals processing and are not reconciled with the Summary of the Day data.

a. Temperature/ Precipitation Tables
  1. 1971-2000 Monthly Normals
  2. Cooperative Summary of the Day
  3. National Weather Service station records
  4. 1971-2000 serially complete daily data

b. Degree Day Table
  1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals
  2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data

c. Snow Tables
  1. Snow Climatology
  2. Cooperative Summary of the Day

d. Freeze Data Table
  1971-2000 serially complete daily data

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normals.html

U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normals/usnormalsprods.html

Snow Climatology Project Description, www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html

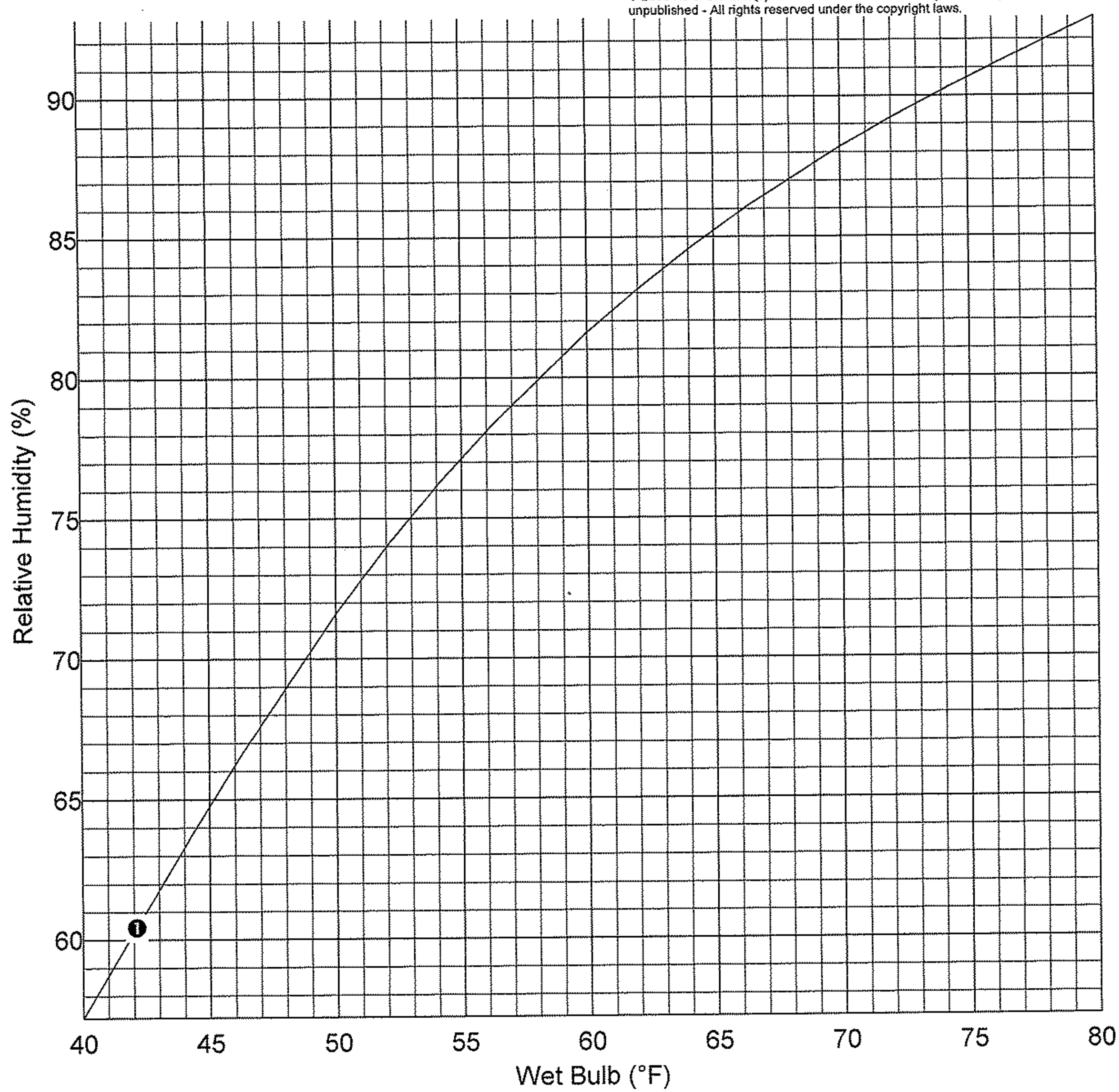
Eischeid, J. K., P. Pasteris, H. F. Diaz, M. Plantico, and N. Lott, 2000: Creating a serially complete, national daily time series of temperature and precipitation for the Western United States. J. Appl. Meteorol., 39, 1580-1591,
www1.ncdc.noaa.gov/pub/data/special/ serialcomplete_jam_0900.pdf

Visual Resources

Attachment DR-153

Fogging Frequency Curve

Fogging Frequency Estimate for Palmdale



SPX Cooling Technologies
TRACS Version 18-SEP-08

Model	F488-5.3-10
Number of Cells	10
Motor Output	250HP
Motor RPM	1800
Fan	10MHP7-9
Fan RPM	119
(Full Speed)	

Design Conditions:

Flow Rate	120200GPM
Hot Water	97.20°F
Cold Water	78.90°F
Wet-Bulb	71.09°F

Curve Conditions:

Fan Pitch	Constant
Dry Dampers	Closed
Flow Rate	120200GPM
(100% Design Flow)	

Tangency 100.2%

FOGGING FREQUENCY CURVE: The curve shown to the left is referred to as a 'Fogging Freqency Curve'. The Fogging Freqency Curve separates entering cooling tower conditions that produce fog at the discharge (Top-Left region of chart) from those that do not produce fog (Bottom-Right region of chart)

❶ 18.3 °F Range
X Design Point

Time: 10:38:59 Date: 04-21-2009 Drawn By: MP

Data Request 144:

The existing Southern California Edison (SCE) 230 kV transmission lines from the Vincent Substation to the Pearblossom Substation provides power to the California Department of Water Resources (CDWR) Pearblossom water pumping plant. The applicant proposes to reconductor and relocate this 230 kV transmission line.

a. Provide evidence showing that SCE has been informed and has agreed to the proposed changes to the Pearblossom-Vincent 230 kV line and any possible interruption to the normal operation of the existing 230 kV circuit.

b. Provide conductor type, size, and length of the existing 230 kV circuit.

c. Provide conductor type, size, and length of reconductored lines.

d. Provide a general environmental analysis and any recommended mitigation measures sufficient to meet CEQA requirements for indirect project impacts.

Response:

a. Please see Attachment DR-144, which includes an email from the California Department of Water Resources (CDWR) (Rick Buckingham), confirming discussions are being held and studies are in progress to address the issues associated with changes to the Pearblossom-Vincent 230- kilovolt (kV) line and possible interruptions to the normal operation of the existing 230-kV line. Inland Energy Inc., on behalf of the Applicant, met with SCE on April 14, 2009 with Mr. Paul Sindelar, SCE project manager assigned to the PHPP project. The topic of discussion was the proposed 230-kV PHPP transmission line. The CDWR line from Pearblossom to Vincent Segment 2 was discussed in great detail. SCE agrees that there is no fatal flaw in the current proposed route and is currently evaluating the right of way (ROW) configuration to decide how best to incorporate the PHPP into the ROW. SCE has informed us that they are looking at long-term use of all SCE ROWs and that the PHPP is included in this regional view. The use of the ROW may include the addition of a future substation called Cassini. While Cassini is a “future substation,” we are working closely to support SCE in their future grid expansion plans. Attachment DR-144 also includes an email of the April 14, 2009 meeting minutes from our conversations with SCE, which indicate these issues have been primary topics of discussion.

b. The existing Pearblossom-Vincent 230-kV circuit serving Los Angeles Department of Water and Power’s (LADWP’s) pumping plant consists of three 1033 MCM ACSR single-conductor lines running approximately 15 miles or 80,000 circuit feet from Vincent to Pearblossom.

c. The existing Pearblossom–Vincent 230-kV circuit was engineered to be reconductored with two 1590 MCM ACSR bundled conductors running approximately 15 miles or 80,000 circuit feet. This engineering is preliminary and may not represent the actual conductor size to be used in construction.

d. With both the Antelope Transmission Project (ATP) and the Tehachapi Renewable Transmission Project (TRTP) in service, the SCE System Impact Study concluded that the PHPP can be integrated into the system. However, additional project specific facilities will be required to satisfy the requested PHPP interconnection plan of service. These upgrades are not part of the ATP or TRTP projects. In order to connect the PHPP to the Vincent Substation, the Applicant proposes to construct a 35.6-mile dedicated generation 230-kV transmission line (gen-tie) from the PHPP (a new customer owned 230/18-kV substation) to the Vincent Substation. In addition, the PHPP will require expansion of the Vincent 230-kV switchyard; however, those changes will be performed by SCE.

The potential environmental impacts from the development of the proposed gen-tie line to the Vincent Substation have been thoroughly evaluated. These impacts and proposed mitigation measures have been reported in the PHPP AFC and in various supplemental data responses. The key areas of analysis along the transmission line route have included the following:

- Biological resource surveys and evaluations, including desert tortoise, Arroyo toad, Swainson's hawk, and other special-status species surveys, including the proposal of mitigation measures for all adverse impacts;
- Determination of potential impact on jurisdictional waters of the US/State along the transmission corridor and adjacent spur roads (the PHPP proposes to avoid all jurisdictional waters to avoid the requirement for a Streambed Alteration Agreement);
- Cultural resource surveys and evaluations that cover the natural and built environment along the transmission line route, including geoarchaeological (i.e., geomorphology) studies of the overall area;
- Land use surveys along the transmission corridor; and
- Visual resources surveys and evaluations along the transmission corridor.

The siting process for the transmission line proposed for PHPP will follow the regular permitting process with the California Energy Commission (CEC), which has jurisdiction over the transmission line to the point of inter-connection with the existing grid. If PHPP receives a certification from the CEC, PHPP will work with SCE as appropriate to obtain any additional approvals that may be needed from the California Public Utilities Commission (CPUC) for the transmission line.

Data Request 145:

The existing 230 kV transmission lines from Vincent to Pearblossom would cross under four 500 kV bundled circuits. Two of these 500 kV circuits are owned by SCE and two are owned by Los Angeles Department of Water and Power (LADWP). As described in the AFC and supplementary material, the Vincent - Pearblossom 230 kV circuit together with the proposed new PHPP 230 kV transmission circuit would be placed on the new PHPP double circuit poles. Therefore, the applicant should inform the proposed modification to SCE and LADWP of the proposed change and should comply with CPUC G.O. 95 overhead electric line construction standards.

a. Provide the existing and proposed 230 kV pole configurations, pole heights, pole types, and transmission line clearance for the undercrossing section.

b. Provide evidence showing both SCE and LADWP are informed of the proposed changes and any possible interruption to the normal operation of their 500 kV circuits.

Response:

Note: There are four 500-kV lines on the transmission corridor. Two of these 500-kV circuits are owned by SCE and two are owned by LADWP. The proposed PHPP transmission lines only cross under two of the existing 500-kV lines owned by LADWP.

a. The existing 230-kV pole configuration currently consists of mostly two wooden pole H-type structures with wood cross braces between the poles and wood cross arms at the top that support three single strings of insulators and three 1033 MCM ACSR single conductors in a horizontal configuration. Also contained in the existing construction are a few three and four wooden pole H-type structures. These are used where the line has additional strength requirements such as angles or additional down strains or are required because of the span lengths. The proposed 230-kV construction would consist of single engineered steel poles with concrete footings with three steel arms extending out 19 feet top, 26 feet middle and 19 feet bottom on each side of the pole. These would support three V-string composite insulators and two1590 MCM ACSR bundled conductors on one side (PHPP) and three V-string insulators and one 1033 MCM ACSR conductor on the other side (LADWP). This is called staggered arm construction used to mitigate galloping above 3,000 feet elevation. The proposed average pole height is 125 feet. Of the two 500-kV lines that would be crossed under, the lowest conductor height measured from ground level is 110 feet. This would require the steel pole on either side of the crossing to be no higher than 90 feet Above Ground Level. The poles would drop from the 125 feet suspension to 90 feet dead end to cross under the 500-kV lines approx 400 feet to another 90 foot dead end then back up to 125 foot level. This would meet the required 20 foot unattached clearance between the 500-kV line and the 230-kV line per G.O.95.

b. The Applicant's consultants and SCE have met on multiple occasions at the SCE Rosemead, California facility to discuss the interconnection approach and possible PHPP 230-kV installation scenarios. Please see April 14, 2009 meeting minutes with SCE and email correspondence with CDWR provided as Attachment DR-144 at the end of this section.

   Additionally, LADWP and SCE were both present at the public workshop held by the CEC in the City of Palmdale on February 4, 2009.

Data Request 146:

> During reconductoring and relocation of the Vincent to Pearblossom 230 kV transmission lines, staff expects the Pearblossom Pumping Plant would have temporary power interruptions. Therefore, the applicant should coordinate with the CDWR for water pumping and maintenance schedules. Provide evidence that the CDWR agrees to any changes to the Vincent - Pearblossom 230 kV line and any service interruptions.

Response:

Please see Attachment DR-144 (located at the end of this section), which includes an email from the CDWR confirming that discussions are being held and studies are in progress to address the issues associated with changes to the Pearblossom-Vincent 230-kV line and possible interruptions to the normal operation of the existing 230-kV line.

Transmission System Engineering

Attachment DR-144

Meeting Notes on PHPP Interconnection Discussions with SCE

Email string between CDWR and Inland Energy regarding relocation of the Vincent to Pearblossom 230 kV transmission lines and temporary power interruptions:

On 4/15/09 2:23 PM, "Rick Buckingham" <rbucking@water.ca.gov> wrote:

Hi Allen,

Glad you emailed. I'm working on the following assumptions as a result of the Feb. 4th workshop. DWR plans to prepare two documents. The first will discuss DWR's concerns/requirements on impacts to Pearblossom during T-Line construction (i.e., how to coordinate outages, durations, etc.). The second document would address concerns when Palmdale would be operating. So, we've already begun internal work on developing the first document. When ready, we'd send it to you and the CEC. That document should be in a couple of weeks.

The second document will require some analysis of your project by DWR's Electrical Engineering group. To do that analysis, we'll need certain info. I'll be conveying the list of needed data to you soon.

Felicia,
What would be the CEC's desire for when documents 1 & 2 would be submitted by DWR ?

Thanks !

==========================
Rick Buckingham
Sr. Transmission Contracts Specialist
CDWR - State Water Project

phone: 916.574.0657
cell: 916.698.7962

From: Allen Cadreau [mailto:allencadreau@inlandenergy.com]
Sent: Wednesday, April 15, 2009 1:58 PM
To: Buckingham, Rick
Subject: Re: For DWP conditions of certification for PHPP 230kv line

Hello Rick, was just wondering how the letter is coming along.

FYI a draft will work as well until we get the final written.

Thanks again. I will CC you on the Correspondence with SCE shortly.
We are discussing the PB to Vincent ROW now.

Allen

On 4/8/09 1:10 PM, "Rick Buckingham" <rbucking@water.ca.gov> wrote:
We'll get right on it …

==========================
Rick Buckingham
Sr. Transmission Contracts Specialist
CDWR - State Water Project

phone: 916.574.0657
cell: 916.698.7962

From: Allen Cadreau [mailto:allencadreau@inlandenergy.com]
Sent: Wednesday, April 08, 2009 1:09 PM
To: Buckingham, Rick
Subject: For DWP conditions of certification for PHPP 230kv line

Hello Rick, I hope the email finds you well.

Per the request below from the CEC could you please provide the letter of proposed conditions you mention at the CEC public meeting in Palmdale. If I recall you wanted to have these included in the conditions of the permit.

This will accomplish two things. First it will satisfy your request as to keeping you in the loop and kicking off early discussions of the City's approach to interconnection and this letter will provide the evidence requested by the CEC that we are coordinating with each other. We are looking to have the responses in by the 15th of April 2009.

Your support in this effort will be greatly appreciated.

Thank you,

Allen

Data Request 146:
During reconductoring and relocation of the Vincent to Pearblossom 230 kV transmission lines, staff expects the Pearblossom Pumping Plant would have temporary power interruptions. Therefore, the applicant should coordinate with the CDWR for water pumping and maintenance schedules. Provide evidence that the CDWR agrees to any changes to the Vincent - Pearblossom 230 kV line and any service interruptions.

Meeting Notes regarding the Palmdale Hybrid Power Project , 4.14.09

Meeting Objective:
Discuss the PHPP permitting status and the need for SCE input.
Discuss the VV2 Lessons Learned to improve the PHPP efforts.
Establish a monthly meeting schedule through the end of the CEC Permitting phase.

Attendees:
Jerry Silva
Paul Sindelar
Tom Barnett
Allen Cadreau
Brian Bennett
Tony Penna

Notes:
A brief discussion of Victorville 2 Hybrid Power Project (VV2) Lessons Learned that are applicable to PHPP.

A lengthy discussion on PHPP interconnection at Vincent.

- o PHPP is included in the SCE Tehachapi Upgrades required at Vincent Substation
- o The Tehachapi upgrades will create slots for PHPP

The Facility Study will be provided in the near term. The delay is due to the large number of serial projects requiring completion of the Facilities Study

A lengthy discussion on the CEC Permitting activities.

- o Tony explained the CEC process allows for preliminary engineering to be used
- o Paul explained that SCE had previously been somewhat reluctant to share information, since it was not finalized. Now that it's clear that preliminary engineering is suitable, Paul thought SCE could respond quickly to assist answering the CEC Data Requests.
- o Allen will provide the CEC Data Requests on Wednesday, April 15th and will provide our draft responses on Friday, April, 17th for SCE's review and concurrence.

Paul indicated that he will be out of the office for 60 days, beginning on May 1st.
He agreed to arrange the necessary turnover meetings with his replacement when the responsible party is identified.

It was agreed that more frequent & formal meetings would be helpful throughout the remainder of 2009.
The meeting schedule was not finalized, but it was generally accepted that meeting at least monthly was prudent.

Paul thought it was appropriate to meet with Jorge Chacon to brief him on the discussions concerning the Victorville 2 Project and the Palmdale Power Project.

Data Request 157:

Please provide data and discussion pertaining to types of aircraft, aircraft patterns and operations based at the Palmdale Airport/ Plant 42. Please include data and discussion regarding approach, crossover and takeoff procedures and traffic patterns. The data should be based on reliable sources, such as the LAWA, City of Palmdale and Air Force.

Response:

Palmdale Regional Airport/Air Force Plant 42 is a joint use military and civilian airfield with 24 hour a day flight operations. The Air Traffic Control Tower is open from 6:30 A.M. to 10:00 P.M. daily. When the tower is closed, the air field is closed. Aircraft, however, may operate on the airfield after hours with prior approval. Civilian flight operations are limited to the south side of the airfield. The flight operations consist primarily of commuter air carrier aircraft. General aviation aircraft are not allowed to land at the airfield without the prior approval of the United States Air Force. Military flight operations maybe conducted 24 hours a day. All of the current aircraft in the Air Force inventory conduct flight operations at Air Force Plant 42. The first 6,000 feet on the east end of taxiway B is used as an assault landing and takeoff strip for C-130 aircraft. Aircraft departing runway 25 and the assault strip begin their upwind turn to downwind west of the PHPP site. Traffic pattern altitudes vary with the type and gross weight of the aircraft; minimum Traffic Pattern Altitude is 1,500 feet Above Ground Level. If an aircraft operates in the traffic pattern north of runways 7 through 25, it will be well clear of the power plant which is located next to hangers on Site 1. As a general rule, the traffic pattern for commercial aircraft will be south of the centerline of runways 7 through 25. Departures from the airport on runways 4, 7, 22 and 25 turn to the north. The power plant clears both instrument and visual flight rules departures protected airspace.

The source of information for the response to Data Request 157 is the United States Government Flight Information Publication Airport/Facility Directory and the Federal Aviation Administration's (FAA's) Obstruction Evaluation process. Additional information on airport operations, aircraft types, runway conditions, etc. are included in Attachment DR-157 provided at the end of this section.

Data Request 158:

Provide a description of the amount of light to be generated into the airspace by the proposed project and its effects on air transportation.

Response:

The background to this request regarding the potential for light to be generated into the airspace by the proposed PHPP suggests two possible sources – stray reflections (glare) from the mirror field and/or stray light from installed lighting fixtures. Potential glare was investigated for the Victorville 2 (VV2) Hybrid Power Project (07-AFC-1), a hybrid project very similar to PHPP that will also use parabolic trough mirrors for solar generation. In that siting case, the California Energy Commission Staff reviewed the light refraction physics and has indicated that the High Desert Power Plant (HDPP) Project would not cause an impact to nearby flight operations. Likewise, PHPP is not expected to have an impact on Palmdale Regional Airport/Air Force Plant 42 flight operations.

With respect to installed industrial incandescent and fluorescent lighting, PHPP operations will require onsite nighttime lighting for safety and security. The installed lighting fixtures at the PHPP will be designed in accordance with power plant industry engineering standards and approved installation practices. These standards and practices include installation procedures to ensure the location of the fixture and the angle of installation, which serve to provide maximum illumination to the subject item or area and provide power plant workers with the maximum lighting needed, while minimizing the amount of stray light (if any) leaving the area. To this end, all exterior lights will be hooded or shielded, and lights will be directed on site so that stray light or glare is minimized. Low-pressure sodium lamps and fixtures of a non-glare type will be specified and careful attention will also be paid to ensure the subject item or subject area is not over illuminated, i.e., the correct candle power illumination is installed.

For areas where lighting is not required for normal operation, safety, or security, switched lighting circuits will be provided, thus allowing these areas to remain un-illuminated (dark) at most times and minimizing the amount of lighting potentially visible off site. It is worth noting that all plant equipment receives an engineering review to determine which equipment items or plant locations require evening illumination. That is to say not all equipment and spaces are illuminated, but only those where routine operator action is required. These engineering and design efforts optimize project illumination and ensure that direct lighting does not illuminate the airspace.

The amount of light generated by the plant is expected to be less than the ambient light generated by the hangers and facilities located on the airport at Air Force Plant 42 Site 1 and other facilities on the north side of the airport adjacent to runways 7 through 25. This determination is based on a comparison of the amount of light generated at VV2 (97-AFC-1) and it's impact on airfield operations at the Southern California Logistics Airport (SCLA). There has been no impact on night operations at the SCLA as a result of the construction and operation of the power plant. Attached is a letter from Mr. Peter Soderquist (see Attachment DR-138 at the end of this section), the Airport Manager at SLCA, regarding stray light from the HDPP, which is located adjacent to the runway. As indicated in Mr. Soderquist's letter, there have been "no" reports by pilots or SCLA ground crews of stray lights affecting airport operations.

By employing the processes and controls listed above, the PHPP will not emit stray light into the project airspace and will not have any adverse effect on air transportation and will be in full compliance of any local policies and ordinances.

Data Request 159:

> Provide a description of the amount/level of electromagnetic interference that may affect aircraft communication and navigational systems taking-off or landing at Palmdale Airport.

Response:

The electromagnetic signal/noise emanating from the PHPP power plant is 60 hertz. Navigation and aviation communication signals used for control and guidance on the Palmdale Regional Airport/Air Force Plant 42 are in the range of 108 megahertz to 135 megahertz (VHF) and 225 Megahertz to 400 megahertz (UHF). Harmonics from the 60 hertz noise generated by the PHPP are low threshold levels that will not interfere with FAA signals. In addition, as a part of FAA review of the construction of the power plant, the Agency's Airways Facilities organization has evaluated the plant's potential for interfering with the FAA's Navigational and Communication systems. No such interference was noted during the FAA's evaluation.

Data Request 160:

> Provide a copy of the current FAA approved "Approach and Clear Zone Plan" for the Palmdale Airport, with the exact location of the proposed power generation facility and transmission towers clearly marked.

Response:

A copy of the current FAA approved "Approach and Clear Zone Plan" including a map clearing marking the exact location of the proposed PHPP plant and transmission pole locations is included as Attachment DR-160 provided at the end of this section.

Data Request 161:

> Please provide discussion pertinent to other airspace activity including crop dusting activities and flights patterns of any other airports within the affected environment.

Response:

Please see Data Response 162 for a response to the question on flight patterns of any other airports within the affected environment. The PHPP is within Palmdale Regional Airport/Air Force Plant 42's controlled airspace. There are no other activities occurring within the controlled airspace of this airport. Flight activities are restricted to military flight test operations and training, with limited approval for commercial air carrier operations on the south side of the airport. According to the City of Palmdale, there are no crop dusting activities that occur within the affected environment (i.e., within six miles of the PHPP plant site).

Data Request 162:

There is no indication that other airports are within the affected environment. Please identify any other airports and if there are crop dusting activities occurring within the affected environment.

Response:

There are no airports (other than the Palmdale Regional Airport/Air Force Plant 42) that are located within the affected environment (i.e., within six miles of the PHPP plant site). However, there are several small airfields that are located in the general vicinity between 10.9 and 17.8 miles distance to the PHPP plant site. These include the following (in order of direct air-mile distance to the PHPP plant site):

General William J. Fox Airfield–10.9 miles NW

Bohunk's Airfield–12.2 miles WNW

Nichol's Farms Airfield–15.0 miles E

Agua Dulce Airpark–15.7 miles SW

Little Buttes Antique Airfield–15.8 miles NW

Crystal Airfield–17.8 miles SE

Rosamond Sky park–18 miles NNW

According to the City of Palmdale, there are no crop dusting activities that occur within the affected environment (i.e., within six miles of the PHPP plant site).

Traffic and Transportation

Attachment DR-157

Palmdale Airport/Plant 42 Airfield Data

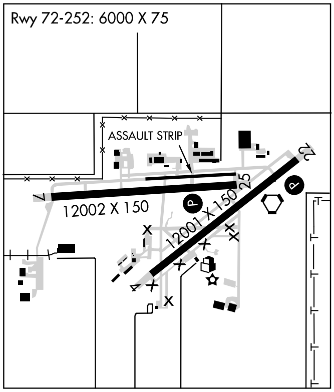
PALMDALE RGNL/USAF PLANT 42

(PMD)(KPMD) CIV/MIL 3 NE UTC−8(−7DT) N34°37.76′ W118°05.07′ **LOS ANGELES**

2543 B TPA—See Remarks **H–4H, L–3E, 4G, 7C**

RWY 07–25: H12002X150 (CONC) S–83, D–173, DT–450, DDT–778 PCN 94 R/B/W/T HIRL **IAP, AD**

RWY 07: 0.5% down. **RWY 25:** PAPI(P4L). Rgt tfc.



RWY 04–22: H12001X150 (CONC) S–83, D–173, DT–315, DDT–778 PCN 73 R/C/W/T HIRL

RWY 04: Hill. Rgt tfc. 0.6% down.

RWY 22: PAPI(P4L). 0.3% up.

RWY 072–252: H6000X75 (CONC) ST–175 PCN 166 R/B/W/T

MILITARY SERVICES: Svc normally associated with an AFB are not avbl at this industrial installation. No Base OPS — Flt plans must be activated/clsd with FSS.

AIRPORT REMARKS: Attended 1330–0730Z‡. Official business only. Military arpt. Civil use requires USAF approval and DD form 2400/01/02. Call 661–272–6708 during duty hrs, 661–272–6600 after duty hrs. Limited fueling avbl to government acft only 1530–0130Z‡. Call plant office to arrange. Rwy 04–22 CLOSED Mon–Thu 1400–0000Z‡ indef. Bird hazard. When twr clsd arpt CLOSED to all tfc without written approval. Primarily training 747–707–727. Unlighted obstructions surround airfield. Rwy 07, Rwy 04 and Rwy 22 3′ wooden box at 150′ from thld. Parking ramp C located south of Rwy 22 and Twy V not visible from twr. ACTIVATE HIRL Rwy 04–22 and Rwy 07–25, PAPI Rwy 22 and Rwy 25—CTAF. Ldg fee.

MILITARY REMARKS: Official business only, Military arpt civil use requires USAF approval and DD form 2400/01/02. Plant Office open weekdays 1530–2359Z‡ only. See FLIP AP/1 Supplementary Arpt Remarks. **RSTD** Official Business Only. PPR for all full stop ldg only. Call C661–272–6715 during duty hrs, OT C661–272–6600 after duty hrs. Rwy 072–252 used as a military assault strip. Assault ldg zone located 1st 6000′ east end of Twy B, assault landing zone open to C–130 acft, PPR only; call C661–272–6715. Assault Landing Zone one way landing assault landing zone 25 only. **CAUTION** Rwy 07–25 1000′ asph overrun each end, overrun poor condition emergency use only. Rwy 04–22 1150′ asph overrun each end, overrun poor condition, emergency use only. **TFC PAT** TPA overhead 4043(1500). Fighter and trainer type acft 4043(1500). All others, rectangular 4543(2000). Acft less than 50,000 pounds 4043(1500). **MISC** Winds are estimated due to FMQ–13 wind sensors being accurate to within only +/− 2 Kt. ATC/Wx will not include/relay wind correction into forecasts/phraseology. Therefore, aircrews will incorporate a +/− 2 Kt accuracy into their decision making process for flying opr.

WEATHER DATA SOURCES: ASOS 118.275 (661) 272–3798.

COMMUNICATIONS: CTAF 123.7

RIVERSIDE FSS (RAL) TF 1–800–WX–BRIEF. NOTAM FILE PMD.

Ⓡ **JOSHUA APP/DEP CON** 124.55 363.0

TOWER 123.7 317.6 (1330–0600Z‡) **GND CON** 121.9 348.6

AIRSPACE: CLASS D svc (1330–0600Z‡) other times CLASS G.

RADIO AIDS TO NAVIGATION: NOTAM FILE PMD.

(H) VORTAC 114.5 PMD Chan 92 N34°37.88′ W118°03.83′ at fld. 2498/15E.

VOR portion unusable:

010°–020° 110°–160° byd 35 NM blo 11,600′

160°–235° byd 30 NM blo 8,100′

TACAN azimuth unusable:

110°–145° byd 20 NM blo 15,500′ 345°–355° byd 35 NM

145°–235° byd 20 NM blo 14,500′

TACAN azimuth and DME unusable:

120°–145° byd 20 NM blo 15,500′ 145°–150° byd 20 NM blo 14,500′

ILS 110.7 I–PMD Rwy 25. Class IE. LOC unusable byd 25° north of course.

Traffic and Transportation

Attachment DR-158

Letter stating HDPP has no impact Airport Operations

GLOBAL ACCESS™

April 6, 2009

Mr. Antonio D. Penna Jr.
14390 Civic Drive
Victorville, CA 92392

Subject: Impact of High Desert Power Project (HDPP) on SCLA Airport Operations

Dear Mr. Penna:

As Mr. Greg Heldreth stated in his November 10, 2005 letter, HDPP has not posed any hazard to Southern California Logistics Airport aircraft operations.

Regarding your recent and more detailed questions related to noise, stray light, and electromagnetic or radiofrequency (RF) interference from High Desert Power Project (HDPP) operations, I offer the following:

HDPP has been operating less than 6,000 feet from the crosswind runway at SCLA for over six years. Southern California Logistics Airport (SCLA) has not experienced any disruptions or interruptions to airport operations in any way whatsoever, due to any HDPP operations, including:

- Excessive noise from facility operations including those generated by the facility's gas turbines(s), HRSG(s), turbine generator(s), cooling towers, auxiliary equipment, or ongoing construction/maintenance operations; all such noise impacts have been eliminated or abated to acceptable levels. In fact the noise emitted from HDPP is masked by the ambient noise of day–to-day airport operations;
- Stray light emitted into the airspace from the facility and/or its night-time operations; the facility incorporates an FAA approved lighting program. The program enhances airport safety by providing distant, visual references for arriving pilots – day or night.
- Electromagnetic or radiofrequency (RF) interference to airport or aircraft communication and navigational systems during take-off or landing at the airport; we have experienced no such disruptions in over six years of HDPP operation.

HDPP has been and continues to be a considerate SCLA tenant and a good neighbor.

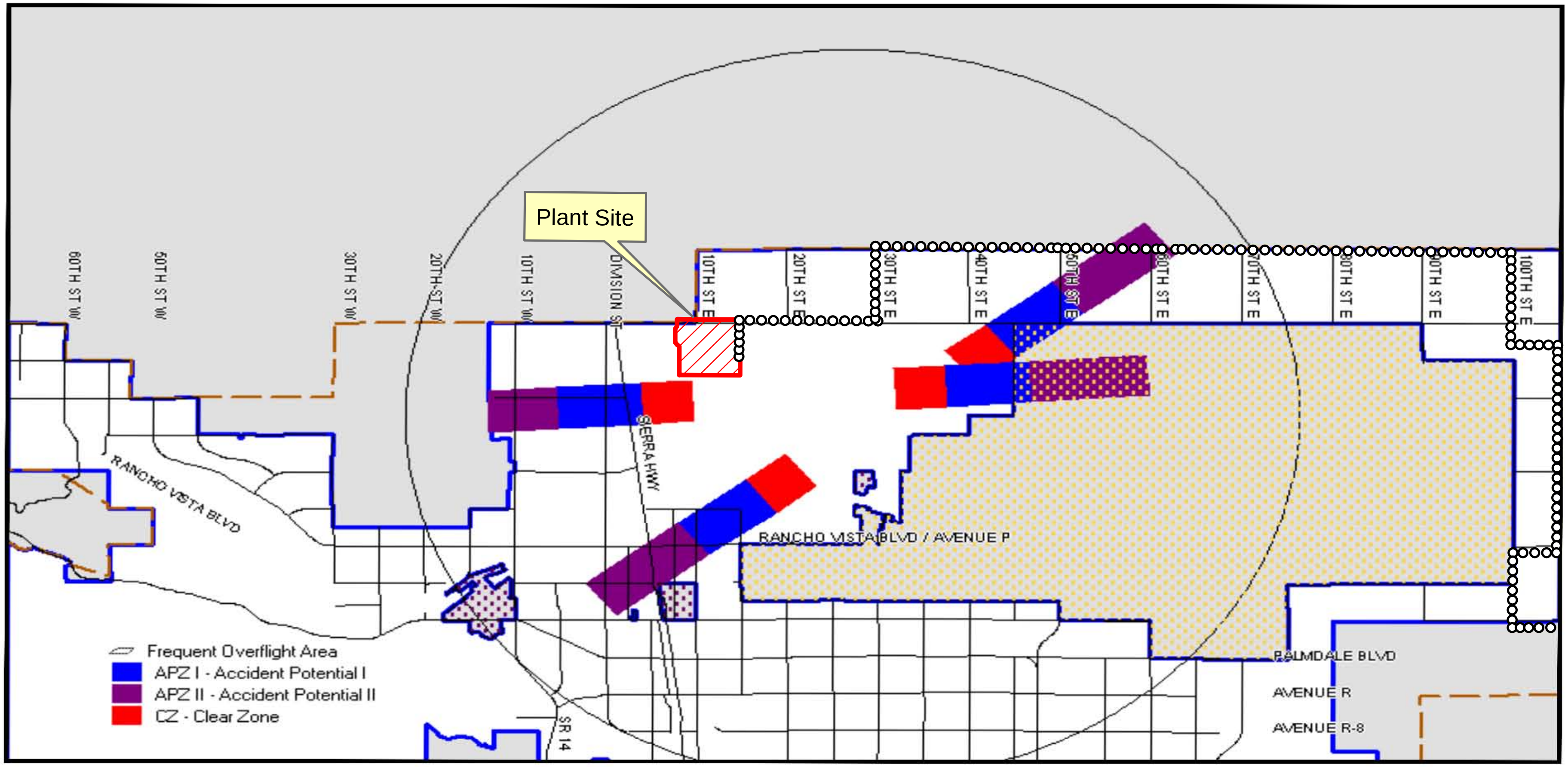
Best Regards,

Peter Soderquist
Airport Manager
Southern California Logistics Airport

Traffic and Transportation

Attachment DR-160

FAA Approach and Clear Zone Plan Map Overlay



PALMDALE
a place to call home

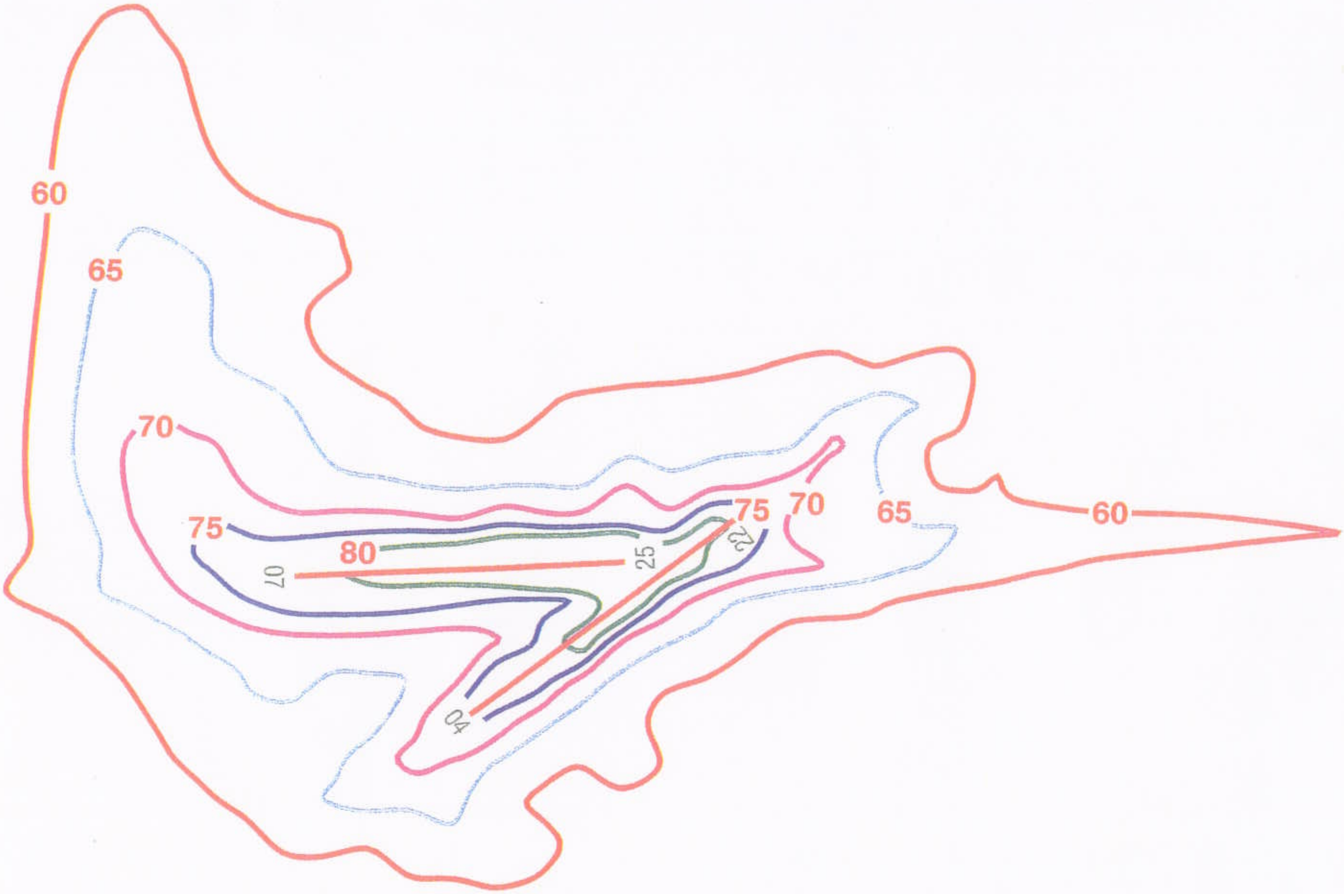
City of Palmdale
Overflight Area

9356 ft 0 9356 ft

N W E S

Printed 04/20/2009

Air Installation Compatible Use Zone Study



Air Force Plant 42
Palmdale, California

2002

AIR INSTALLATION
COMPATIBLE USE ZONE STUDY

AIR FORCE PLANT 42
PALMDALE, CALIFORNIA

2002

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS

AFI	Air Force Instruction
AGL	Above ground level
AICUZ	Air Installation compatible use zone
APZ	Accident potential zone
CNEL	Community noise equivalent level
CZ	Clear zone
DNL	Day-night average a-weighted sound level
DoD	Department of Defense
dB	Decibel
FAA	Federal Aviation Administration
INM	Integrated noise model
JLUC	Joint Land Use Committee
LAWA	Los Angeles World Airport
NLR	Noise level reduction
Plant 42	Production Flight Test Installation, Air Force Plant 42
PT&CC	Palmdale Trade and Commerce Center
SLUCM	Standard Land Use Coding Manual
UFC	Unified Facilities Criteria
USEPA	United States Environmental Protection Agency
VFR	Visual flight rules

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 1
PURPOSE AND NEED

1.1 Introduction

This study is an update of the 1990 Production Flight Test Installation, Air Force Plant 42 (Plant 42) Air Installation Compatible Use Zone (AICUZ) Study. The update presents and documents changes to the AICUZ amendment for the period 1991-2001 and is based on the 2001 aircraft operations condition, to include anticipated future operations and aircraft maintenance activity. This AICUZ Study reaffirms Air Force policy of promoting public health, safety, and general welfare in the areas surrounding Plant 42. Specifically, the report documents changes in aircraft operations since the last study and provides noise contours and compatible use guidelines for land areas surrounding the installation based on a combination of the November 2001 operations and the anticipated future aircraft and maintenance runup operations. This information is provided to assist local communities and serve as a tool for future planning and zoning activities. Changes that occurred since the 1990 Plant 42 AICUZ Study are:

- The mix of aircraft that accomplish operations at Plant 42;
- The addition, elimination, and modification of aircraft flight tracks to correspond to flying operations changes; and
- Technical improvements to the NOISEMAP computer modeling program.

1.2 Purpose and Need

The purpose of the long-standing AICUZ program is to promote compatible land development in areas subject to aircraft noise and accident potential. As the cities of Palmdale and Lancaster and Los Angeles County prepare and modify land use development plans, recommendations from this updated AICUZ Study should be included in the planning processes to prevent incompatible land uses that may compromise the ability of Plant 42 to fulfill its mission. Accident potential and aircraft noise should be major considerations in the planning processes.

Air Force AICUZ guidelines reflect land use recommendations for the clear zones (CZ), accident potential zones (APZ) I and II, and the four noise zones (Day-Night Average A-Weighted Sound Level [DNL] 65-69 decibel [dB], DNL 70-74 dB, DNL 75-79 dB, and DNL 80 dB and greater). These guidelines were established on the basis of studies prepared and sponsored by several federal agencies, including the United States Department of Housing and Urban Development, United States Environmental Protection Agency (USEPA), United States Air Force, and state and local agencies. The guidelines recommend land uses that are compatible with airfield operations while allowing maximum beneficial use of adjacent properties. The Air Force has no desire to recommend land use regulations that render property economically useless. It does, however, have an obligation to the inhabitants of the Plant 42 area of influence and the citizens of the United States to point out ways to protect people in adjacent areas and public investment in the installation itself. The AICUZ area of influence includes the area within the DNL 65 dB and greater noise exposure area and the area within the CZs and APZs.

The AICUZ program uses the latest technology to define noise levels in areas near Air Force installations with a flying mission. An analysis of Plant 42's flying operations was performed, including types of aircraft, flight patterns utilized, variations in altitude, power settings, number of operations, and hours of operations. This information was used to develop the noise contours contained in this study. The Department of Defense (DoD) NOISEMAP (Version 6.5) computer modeling program and the DNL metric were used to define the noise zones for Plant 42.

1.3 Process, Procedure, and Noise Metrics

Preparation and presentation of this update to Plant 42's AICUZ Study is part of the continuing Air Force participation in the local planning process. Guidance for the Air Force AICUZ program is contained in Air Force Instruction (AFI) 32-7063, *Air Installation Compatible Use Zone Program*, which implements DoD Instruction 4165.57, *Air Installations Compatible Use Zones*.

It is recognized that, as local communities prepare land use plans and zoning ordinances, the Air Force has the responsibility to provide input on its activities relating to the community. This study is presented in the spirit of mutual cooperation and assistance by Plant 42 to aid in the local land use planning process. Noise contours depicted on the AICUZ maps in this study are based on the 2001 levels of flying and aircraft maintenance activities plus the anticipated future aircraft operations and maintenance runup activity.

The aircraft operational and maintenance data, as well as the anticipated future aircraft operations and maintenance runup activity used in this study, were collected at Plant 42 in November 2001. The Air Force reviewed and validated the data in January 2002. Aircraft flight and maintenance operational data were obtained to derive average daily operations by runway and type of aircraft. These data were supplemented by flight track information (where we fly), flight profile information (how we fly), and ground runup information. After verification for accuracy, the data were input into the NOISEMAP Version 6.5 computer program to produce DNL noise contours. The noise contours for Plant 42 were plotted on an area map and overlaid with the CZ and APZ areas for the installation.

California standards for community noise use the Community Noise Equivalent Level (CNEL), in which a 5-dB penalty is added to each aircraft operation in the 7:00 p.m. to 10:00 p.m. period, and a 10-dB penalty to each operation in the 10:00 p.m. to 7:00 a.m. period. The Air Force uses the DNL metric, which is identical to the CNEL, except that the evening noise penalty is not added on this metric. The DNL metric includes the same 10-dB penalty for operations after 10:00 p.m. CNEL noise contours were developed and are illustrated in this report; however, there is no discernable difference between the DNL and CNEL contours. Thus, DNL is used for land use analysis purposes in this AICUZ Study.

1.4 Computerized Noise Exposure Models

The Air Force adopted the NOISEMAP computer program to describe noise impacts created by aircraft operations. NOISEMAP is one of two USEPA-approved computer programs; the other is the Integrated Noise Model (INM) used by the Federal Aviation Administration for noise analysis at civil airports. The NOISEMAP and INM programs are similar; however, INM does not contain noise data for all military aircraft.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 2
INSTALLATION DESCRIPTION

2.1 Description of Air Force Plant 42

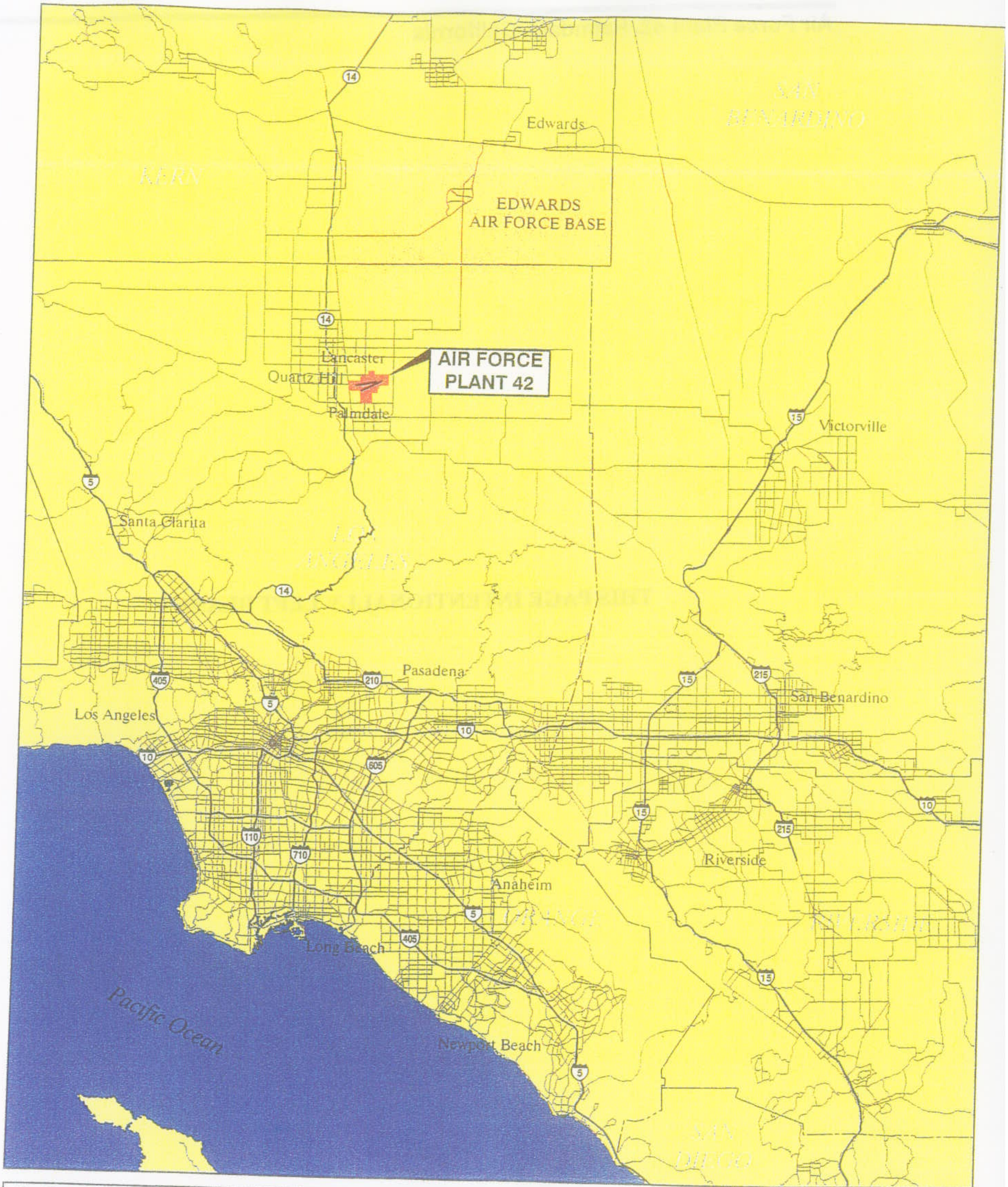
Plant 42 is located in the northern area of Los Angeles County, California known as the Antelope Valley. The plant is approximately 50 miles north of the City of Los Angeles and is located within the incorporated boundary of Palmdale. The installation is about 2 miles east of California Highway 14. Plant 42 has 5,800 acres of property and has two active runways, respectively designated as Runways 04/22 and 07/25. The location of Plant 42 and the area around the installation are shown on Figures 2.1 and 2.2.

2.2 Mission

Plant 42 is a government-owned, contractor-operated facility consisting of eight separate production sites sharing a common runway complex. Detachment 1, an element of the Aeronautical Systems Center located at Wright-Patterson Air Force Base, Ohio, is the host unit at Plant 42. Major aircraft corporations such as Boeing, Lockheed-Martin, and Northrup-Grumman are located at production sites on the installation. The Plant 42 mission is to provide and maintain facilities for: (1) mating and final assembly of jet-powered, high performance aircraft; (2) production engineering and flight test programs; and (3) Air Force acceptance flight test of high performance jet aircraft. The installation supports the newest and most advanced commercial and military aerospace systems.

In 1989 the City of Los Angeles Department of Airports and the Air Force entered into a Joint Use Agreement allowing domestic commercial air service from Plant 42. As many as 400 daily aircraft operations are allowed under the agreement. Under this agreement, the Los Angeles World Airports (LAWA, formerly the Department of Airports) established the Palmdale Regional Airport terminal on land leased from the Air Force and used the plant's runways. Scheduled commercial air service continued through late spring 1998. Although the Palmdale area has not been able to sustain minimal air service due to insufficient passengers in the catchment area, LAWA recently committed to a new marketing program to attract air traffic as well as maintenance facilities and services to the Palmdale Regional Airport. The result of this effort is that aircraft maintenance activities occur at a facility adjacent to Plant 42 and air cargo service may begin in the near future. Aircraft undergoing maintenance at the adjacent facility use the Plant 42 airfield for arrivals and departures, as well as takeoffs, landings, and closed patterns during aircraft systems flight checks. The operator of the facility anticipates an increase in the number of aircraft that will be serviced at the facility. This increase will result in a higher level of both aircraft operations and maintenance runups. The additional aircraft operations associated with the increased maintenance facility activity and the aircraft maintenance engine runups at the facility, as well as the anticipated air cargo aircraft operations, are included in this AICUZ Study.

THIS PAGE INTENTIONALLY LEFT BLANK



Air Force Plant 42

2002 AICUZ Study

LEGEND

- Runway
- Highway
- Roadway
- County Line
- Air Force Plant 42
- Edwards AFB

15 0 15
Miles

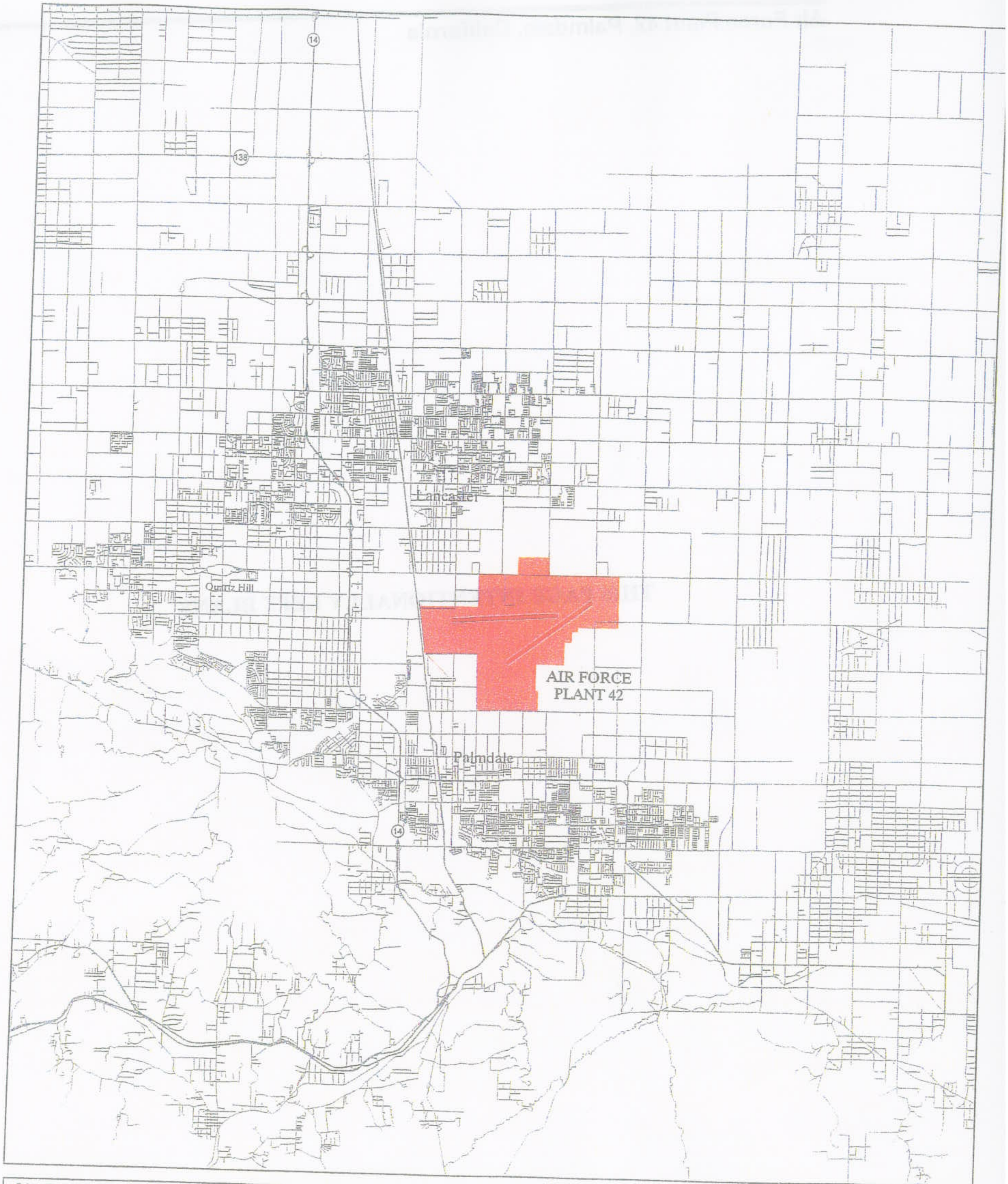
N

740583 P42-LOC.DWG

Plant 42 Location Map

Figure 2.1

THIS PAGE INTENTIONALLY LEFT BLANK



Air Force Plant 42

LEGEND

Runway

Highway

Roadway

Air Force Plant 42

2002 AICUZ Study

3 0 3

Miles

N

740583 P42-VIC.DWG

Plant 42 Vicinity Map

Figure 2.2

THIS PAGE INTENTIONALLY LEFT BLANK

2.3 Economic Impact

Plant 42 is a major part of the Antelope Valley economy. In July 1999, Plant 42 had approximately 8,500 employees working in and around the airfield complex. Although the plant is a major contributor to employment, its employment statistics vary tremendously to correspond to the beginning and ending of major aircraft production runs. For example, in January 1988 employment was close to 12,000 people. Four years later in January 1992, employment was at a low of approximately 7,000 people. The economic impact is felt not only in the area of employment, but also in an annual payroll totaling almost one half billion dollars spent in the local community, and local contracts of almost $34 million, which also vary according to production schedules (Plant 42 Fact Sheet, ca. 2001).

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 3
AIRCRAFT OPERATIONS

3.1 Introduction

To describe the relationship between aircraft operations and land use at and around Plant 42, it is necessary to fully evaluate the exact nature of flying activities. The November 2001 inventory of Plant 42 aircraft operations included where aircraft fly, how high they fly, how many times they fly over a given area, and at what time of day they operate.

Section 3.2 discusses aircraft operations at Plant 42. Section 3.3 discusses runway and flight track utilization for all operations by aircraft type. Section 3.4 describes aircraft maintenance runup operations, Section 3.5 discusses aircraft flight profiles, and Section 3.6 presents climatological data.

3.2 Aircraft Operations

The most recent amendment to the Plant 42 AICUZ Study was accomplished in 1990 to reflect the different mix of transient aircraft and flight tracks, new and anticipated future aircraft production programs, and the addition of commercial air traffic. The mix of aircraft that conduct operations at Plant 42 has changed since the last AICUZ Study. This change required the addition, elimination, and modification of flight tracks and profiles to correspond to the current mix of aircraft operating at the airfield. Additionally, the number of daily and annual aircraft operations has changed. Therefore, this AICUZ Study reflects changes in flight operations that occurred since 1990, and considers Plant 42 aircraft operations as of November 2001, as well as the anticipated future operations.

Table 3.1 summarizes the combined historical aircraft operations for Plant 42 for 1991 through 2000. It is estimated that about 43,637 annual operations occurred in 2001 based on aircraft operations data collected in November 2001. An aircraft operation is defined as one takeoff/departure, one approach/landing, or half a closed pattern. A closed pattern consists of two portions, a takeoff/departure and an approach/landing, *i.e.*, two operations. A sortie is a single military aircraft flight from the initial takeoff through the termination landing. The minimum number of aircraft operations for one sortie is two operations, one takeoff (departure) and one landing (approach).

Table 3.1
Historical Annual Aircraft Operations at Plant 42

Year	Aircraft Operations
1991	44,420
1992	62,822
1993	data not available
1994	data not available

Table 3.1
Historical Annual Aircraft Operations at Plant 42 (continued)

Year	Aircraft Operations
1995	53,731
1996	59,283
1997	58,396
1998	50,993
1999	62,370
2000	45,121

Source: Plant 42, 2002

The number of military and civil aircraft operations at an installation usually varies from day to day. NOISEMAP requires input of the specific numbers of daily flight and aircraft maintenance engine runup operations. The Air Force does not follow the Federal Aviation Administration (FAA) in its use of the "average annual day" in which annual operations are averaged over an entire 365-day year. The Air Force also does not use the "worst-case day" since it typically does not represent the typical noise exposure either. Instead, the Air Force uses the "average busy day" concept in which annual operations for an aircraft type are averaged over the number of flying days per year by that aircraft type. Non-flying days (for example, weekends or holidays) are not used in computing the "average busy day" operations. Due to the plant's mission and the large number of transient aircraft types that use the airfield, the number of days per year that aircraft operate at Plant 42 varies by aircraft type and ranges from 104 to 365 days.

Table 3.2 summarizes the average busy-day flight operations at Plant 42 for 2001 derived from information provided by Plant 42 staff, flying organization personnel, and air traffic control tower personnel. Aircraft types operating at the plant consist of both military and civil aircraft. Approximately 70 types of military and civil aircraft conduct operations at Plant 42, and many types have less than one operation per day. Thirteen aircraft were selected for noise modeling purposes, with selection preference based on the uniqueness of a particular aircraft or those with the greatest number of operations. Operations for the other 57 aircraft types were combined with the selected aircraft based on similar characteristics (*e.g.*, number and type of engines, size of aircraft, airspeed, *etc.*). Aircraft types with the greatest average daily operations are: C-130, 38 percent; DC-10, 25 percent; Beech 1900, 10 percent; and F-117, 7 percent. The table reflects a total of 235.79 average busy-day aircraft operations based on November 2001 aircraft operations data. About 17 percent of the total daily operations occur during the evening (7:00 p.m.-10:00 p.m.) and approximately 6 percent of the operations are accomplished during nighttime (10:00 p.m.-7:00 a.m.).

Table 3.2
Average Busy Day Aircraft Operations for 2001

Aircraft Type	Daily Arrival/ Departure Operations	Daily Closed Pattern Operations	Total Daily Operations
F-117	5.55	9.64	15.19
U-2	2.04	1.32	3.36
B-1	2.28	3.88	6.16
C-9	3.60	7.60	11.20
C-130	14.79	71.28	86.07
KC-135	4.79	2.30	7.09
F-16	13.21	33.20	46.41
T-39	2.85	0.72	3.57
DC-8	4.14	0.00	4.14
DC-10	7.20	3.90	11.10
Beech 1900	24.00	0.00	24.00
Single Engine	6.50	6.50	13.00
Helicopter	4.50	0.00	4.50
Total	95.45	140.34	235.79

Note: An operation is one takeoff/departure or one arrival/landing. A closed pattern consists of two operations, one takeoff and one landing.

Source: Plant 42, 2002

As mentioned in Section 2.2, Plant 42 and the Los Angeles World Airports have a Joint Use Agreement that allows as many as 400 daily commercial aircraft operations at the airfield. Scheduled commercial air carrier service was discontinued in 1998, and no commercial air carrier service existed in November 2001. The only commercial aircraft operations considered in this AICUZ Study are the projected air cargo operations (two aircraft, four operations per day). Additionally, aircraft operations associated with the aircraft maintenance facility adjacent to Plant 42 are anticipated to increase from 1.38 to 2.76 average daily operations in the future. This study reflects the additional aircraft operations associated with aircraft maintenance activities as well as air cargo operations.

3.3 Runway and Flight Track Utilization

The Plant 42 airfield has two runways: one is oriented 038°–218° (04/22); the second is oriented 072°–252° (07/25). Both runways are approximately 12,000 feet long and 150 feet wide. Each runway has overruns at the runway ends. The airfield elevation is 2,543 feet above mean sea level. Overhead traffic patterns accomplished by fighter and trainer type aircraft are flown at an altitude of approximately 1,500 feet above ground level (AGL).

Traffic patterns flown by all other aircraft are accomplished at about 2,000 feet AGL. Overhead patterns flown at the airfield maneuver to the southeast of Runway 04/22 and north of Runway 07/25.

Other airports, airspace, and terrain within the area surrounding Plant 42 influence aircraft arrival and departure flight tracks at the installation. The General William J. Fox Airfield is about 10 miles northwest of Plant 42. The southern edge of restricted airspace associated with Edwards Air Force Base lies approximately 10 miles north of Plant 42. The location and proximity of Fox Airfield and the restricted airspace relative to Plant 42 require that arriving and departing aircraft be routed to avoid conflict. Additionally, rapidly rising terrain to the south, southwest, and west of Plant 42 influence arrivals and departures in these areas.

Noise abatement procedures have been implemented to reduce aircraft noise in the areas surrounding Plant 42. Aircraft using Runways 22 and 25 should begin a right turn no later than the Sierra Highway, about half a mile from the west end of Runway 07/25. Overflight of the communities of Palmdale and Lancaster below 3,500 feet AGL will be avoided when possible. Afterburner use should be minimized for both runways, and all aircraft should avoid overflight of populated areas at altitudes of less than 1,200 feet AGL. All aircraft will climb to traffic pattern altitude (*i.e.*, 1,500 feet AGL or 2,000 feet AGL) as soon as possible after takeoff, touch and go, or missed approach.

Considering the above limitations, aircraft operating at Plant 42 use the following basic flight patterns:

- Straight out departures; however, many departures from Runways 22 and 25 turn soon after departure to avoid the rising terrain to the south and southwest and because their destination is north or east of Plant 42;
- Straight-in approaches;
- Visual Flight Rules (VFR) or overhead landing patterns to the north side Runway 07/25 and the southeast side of Runway 04/22;
- Instrument Flight Rules or radar closed patterns to the north of the airfield;
- VFR rectangular closed patterns to the north side of Runway 07/25 and the southeast side of Runway 04/22; and
- Re-entry VFR patterns.

Flight patterns specific to Plant 42 result from several considerations, including:

- Takeoff patterns routed to avoid noise-sensitive areas as much as possible;
- Criteria governing the speed, rate of climb, and turning radius for each type of aircraft;
- Efforts to control and schedule missions to keep noise levels low, especially at night; and
- Coordination with the FAA to minimize conflict with civilian aircraft operations.

Planning for the areas surrounding an airfield considers three primary aircraft operational/land-use determinants: (1) aircraft accident potential to land users; (2) aircraft noise; and (3) hazards to operations from land uses (such as the height of structures). Each of these concerns is addressed in conjunction with mission requirements and safe aircraft operations to determine the optimum flight track for each aircraft type. The flight tracks depicted in Figures 3.1 through 3.3 are the result of such planning and depict the modeled average busy-day flight tracks for the operations listed in Table 3.2. Air traffic at Plant 42 is in an easterly flow (Runways 04 and 07) about 10 percent of the time, and a westerly flow (Runways 22 and 25) about 90 percent of the time.

3.4 Aircraft Maintenance Runup Operations

To the maximum extent possible, aircraft maintenance engine runup locations have been established in areas to minimize noise for people at Plant 42, as well as for those in the surrounding communities. Aircraft maintenance engine runup operations are accomplished by based flying units and their associated maintenance functions as well as by Lockheed Martin and SR Technics at facilities adjacent to Plant 42.

Average busy-day aircraft maintenance runup operations were calculated similarly to flight operations described in Section 3.1. Weekly, monthly, or annual estimates of runups provided by aircraft maintenance personnel from activities as well as by personnel from the facilities adjacent to Plant 42 were divided by the typical number of days runups were performed over the respective period. Approximately 17 percent of the aircraft maintenance runup time occurs during the evening (7:00 p.m.-10:00 p.m.), and 15 percent at night (10:00 p.m.-7:00 a.m.).

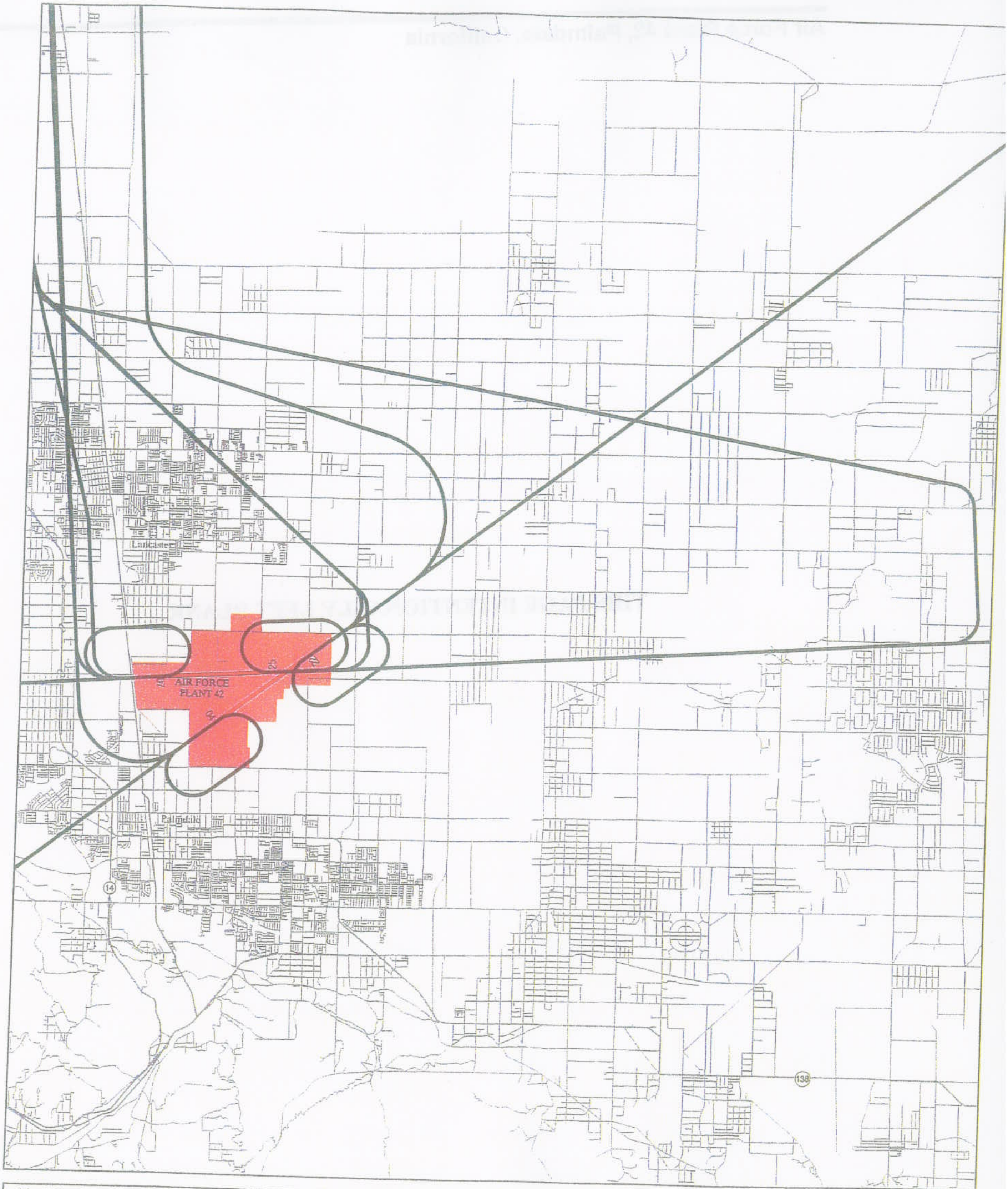
3.5 Aircraft Flight Profiles

For the purposes of this AICUZ Study, aircraft "flight profiles" denote the aircraft power settings, altitudes above runway level, and airspeeds along each flight track. All aircraft flight profiles for C-130, F-117, and U-2 aircraft were obtained from the organizations that operate the aircraft. Flight profiles from the BASEOPS database were used to model transient operations for the other military and civil aircraft types. Noise data from the NOISEFILE database were used to model operations for all aircraft types.

3.6 Climatological Data

Weather, measured by temperature and relative humidity, is an important factor in the propagation of noise. Temperature and relative humidity affect sound absorption. NOISEMAP uses the average daily temperature and relative humidity for each month to determine the appropriate values to represent the given year. Historical climatological information in terms of mean temperature and mean relative humidity for each month was obtained from Plant 42 and are listed in Table 3.3.

THIS PAGE INTENTIONALLY LEFT BLANK



Air Force Plant 42

LEGEND

Flight Track

Runway

Highway

Roadway

Air Force Plant 42

2002 AICUZ Study

3 0 3

Miles

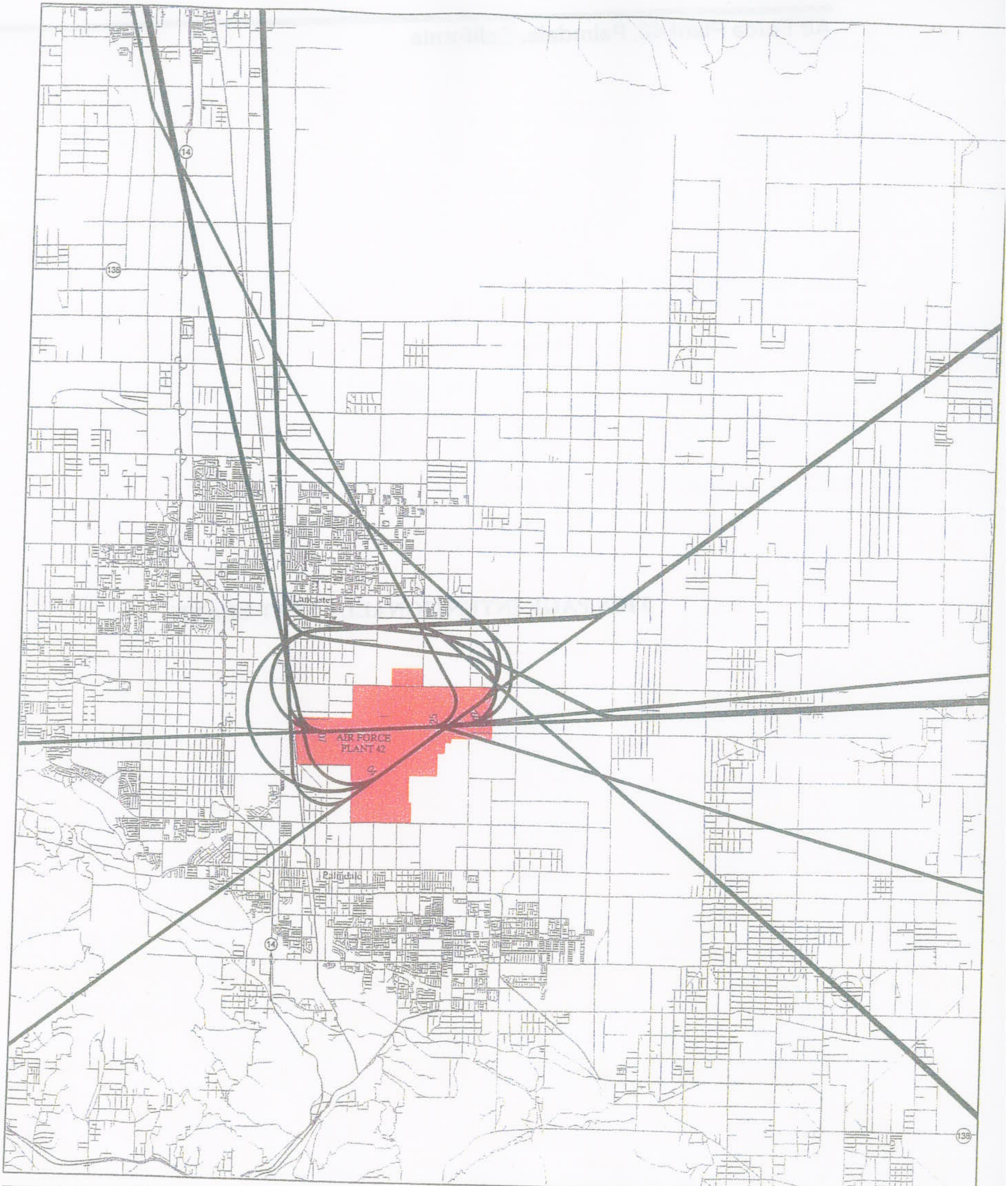
N

740583 P42–ARR.DWG

Arrival Flight Tracks

Figure 3.1

THIS PAGE INTENTIONALLY LEFT BLANK



Air Force Plant 42

LEGEND

Flight Track

Runway

Highway

Roadway

Air Force Plant 42

3 0 3

Miles

N

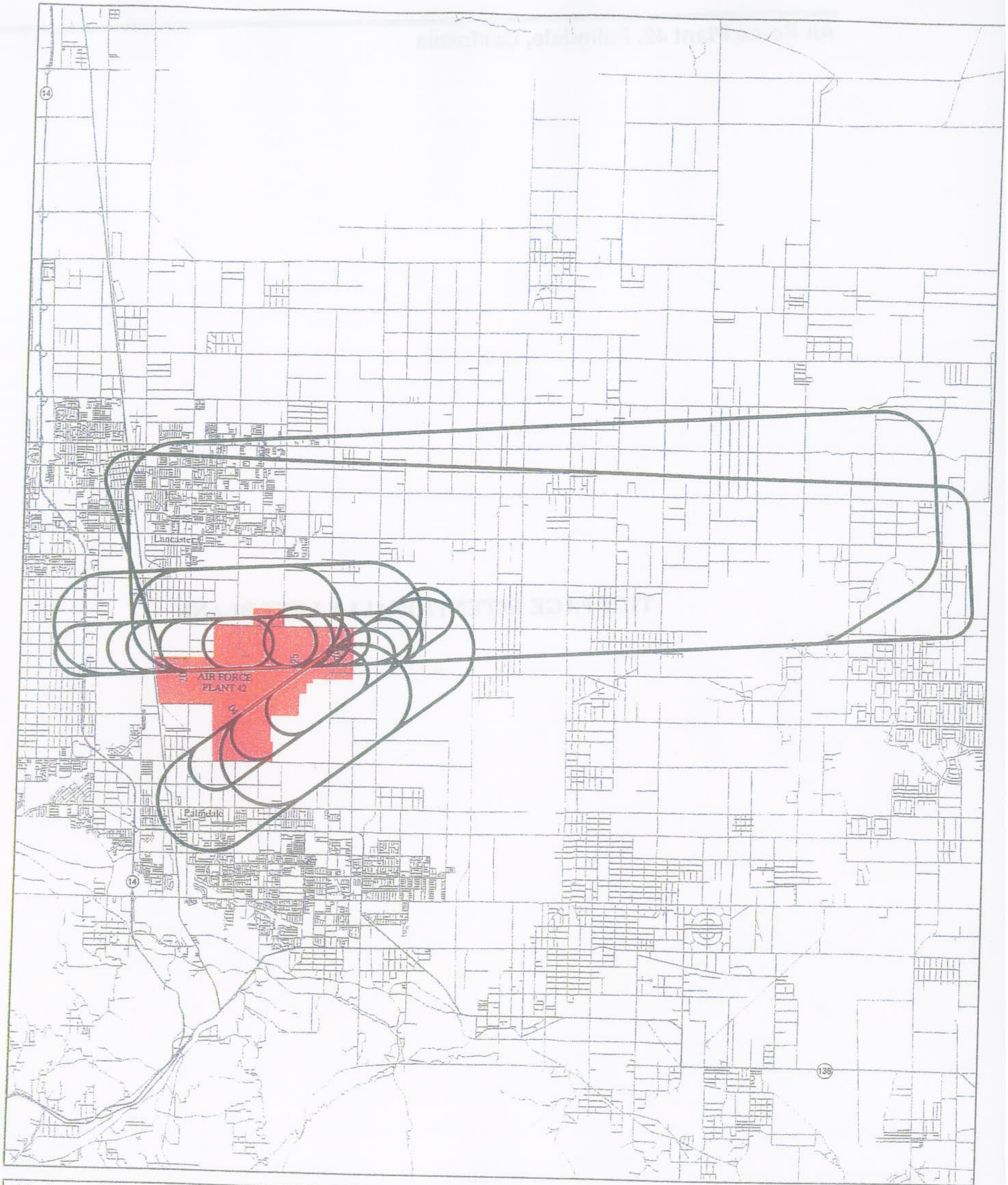
2002 AICUZ Study

Departure Flight Tracks

Figure 3.2

740583 P42-DEP.DWG

THIS PAGE INTENTIONALLY LEFT BLANK



Air Force Plant 42

LEGEND

Flight Track

Runway

Highway

Roadway

Air Force Plant 42

3 0 3

Miles

N

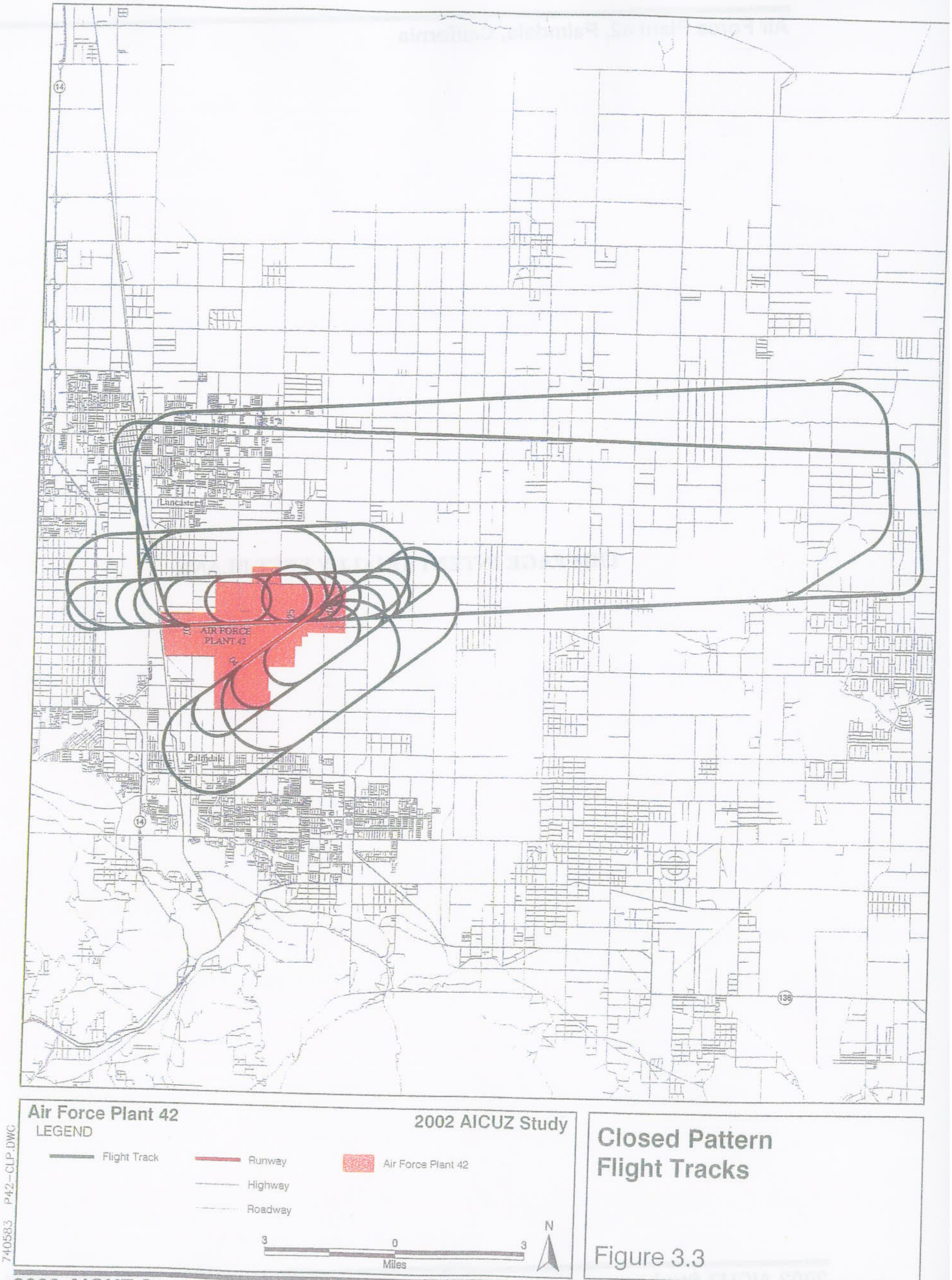
2002 AICUZ Study

740583 P42-CLP.DWG

Closed Pattern Flight Tracks

Figure 3.3

THIS PAGE INTENTIONALLY LEFT BLANK



Closed Pattern Flight Tracks

Figure 3.3

THIS PAGE INTENTIONALLY LEFT BLANK

Table 3.3
Climatological Data

Month	Average Temperature (°F)	Average Relative Humidity (%)
January	44	61
February	50	52
March	54	52
April	59	42
May	67	40
June	75	31
July	80	30
August	82	29
September	75	31
October	64	38
November	53	42
December	46	53
Mean Temperature	62	
Mean Relative Humidity		42

Source: AFCCC/DOS September 1996.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 4
EFFECTS OF AIRCRAFT OPERATIONS

4.1 Introduction

This section has two purposes. The first is to describe effects of the existing aircraft operations in terms of imaginary surfaces associated with obstructions to air navigation, noise exposure, and clear zones (CZ) and accident potential zones (APZ). The second purpose is to present applicable land-use compatibility guidelines and extent of the Air Force's participation in the land-use planning process.

4.2 Runway Airspace Imaginary Surfaces

The runway airspace imaginary surfaces, in graphical form, are the result of the application of obstruction height criteria to the Plant 42 airfield. Imaginary surfaces are surfaces in space around airfields in relation to runways. The surfaces are designed to define the obstacle free airspace around the airfield. For a more complete description of runway airspace imaginary surfaces for Class A and Class B runways, refer to Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*. Figure 4.1 depicts the runway airspace imaginary surfaces for Plant 42. Air Force obstruction criteria in UFC 3-260-01 are based on those contained in Federal Aviation Regulation Part 77, *Objects Affecting Navigable Airspace*, Subpart C.

Obstructions to air navigation are considered to be:

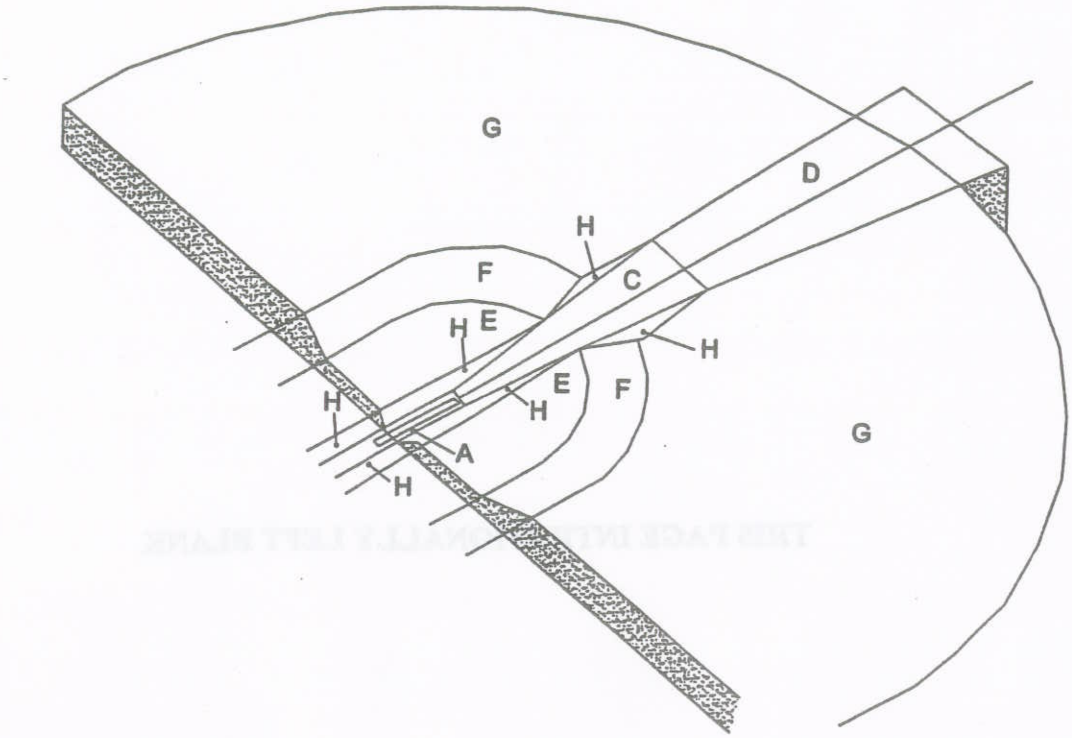
- Natural objects or man-made structures that protrude above the planes or surfaces, and/or;
- Man-made objects that extend more than 500 feet above the ground at the site of the structure.

4.2.1 Explanation of Terms

The following elevation, runway length, and dimensional criteria apply:

- Controlling Elevation—whenever surfaces or planes within the obstruction criteria overlap, the controlling (or governing) elevation becomes that of the lowest surface or plane.
- Runway Length—Plant 42 has two Class B runways designed and built for sustained aircraft landings and take-offs.
- Established Airfield Elevation—The established elevation for the Plant 42 airfield is 2,543 feet above mean sea level.
- Dimensions—All dimensions are measured horizontally unless otherwise noted.

THIS PAGE INTENTIONALLY LEFT BLANK



LEGEND

A. Primary Surface
B. Clear Zone Surface (Not shown)
C. Approach-Departure Clearance Surface (50:1 Slope Ratio)
D. Approach-Departure Clearance Surface (Horizontal)
E. Inner Horizontal Surface (45.72m [150'] Elevation)
F. Conical Surface (20:1 Slope Ratio)
G. Outer Horizontal Surface (152.40m [500'] Elevation)
H. Transitional Surface (7:1 Slope Ratio)
I. Not Used
J. Accident Potential Zone (APZ) (Not Shown)

NOTE: THE OUTER EDGE OF THE OUTER HORIZONTAL SURFACES (G) EXTENDS TO 44,500 FEET FROM THE RUNWAY CENTERLINE.

Figure 4.1. Class B Air Force Runway Airspace Imaginary Surfaces.

THIS PAGE INTENTIONALLY LEFT BLANK

4.2.2 Runway Airspace Imaginary Surfaces

The following paragraphs contain definitions of the runway airspace imaginary surfaces for Air Force class "B" runways:

- Primary Surface—An imaginary surface symmetrically centered on the runway, extending 200 feet beyond each runway end that defines the limits of the obstruction clearance requirements in the vicinity of the landing area. The width of the primary surface is 2,000 feet, or 1,000 feet on each side of the runway centerline.
- Clear Zone Surface—An obstruction-free surface on the ground symmetrically centered on the extended runway centerline beginning at the end of the runway and extending outward 3,000 feet. The CZ width is 3,000 feet (1,500 feet to either side of runway centerline).
- Approach-Departure Clearance Surface—This imaginary surface is symmetrically centered on the extended runway centerline, beginning as an inclined plane (glide angle) 200 feet beyond each end of the primary surface, and extending for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the starting point. The width of this surface at the runway end is 2,000 feet, flaring uniformly to a width of 16,000 feet at the end point.
- Inner Horizontal Surface—This imaginary surface is an oval plane at a height of 150 feet above the established airfield elevation. The inner boundary intersects with the approach-departure clearance surface and the transitional surface. The outer boundary is formed by scribing arcs with a radius 7,500 feet from the centerline of each runway end and interconnecting these arcs with tangents.
- Conical Surface—This is an inclined imaginary surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation. The slope of the conical surface is 20:1. The conical surface connects the inner and outer horizontal surfaces.
- Outer Horizontal Surface—This imaginary surface is located 500 feet above the established airfield elevation and extends outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.
- Transitional Surface—This imaginary surface extends outward and upward at right angles to the runway centerline and extended runway centerline at a slope of 7:1. The transitional surface connects the primary and the approach-departure clearance surfaces to the inner horizontal, the conical, and the outer horizontal surfaces.

- Accident Potential Zone Surfaces—APZ I begins at the outer end of the CZ and is 5,000 feet long and 3,000 feet wide. APZ II begins at the outer end of APZ I and is 7,000 feet long and 3,000 feet wide.

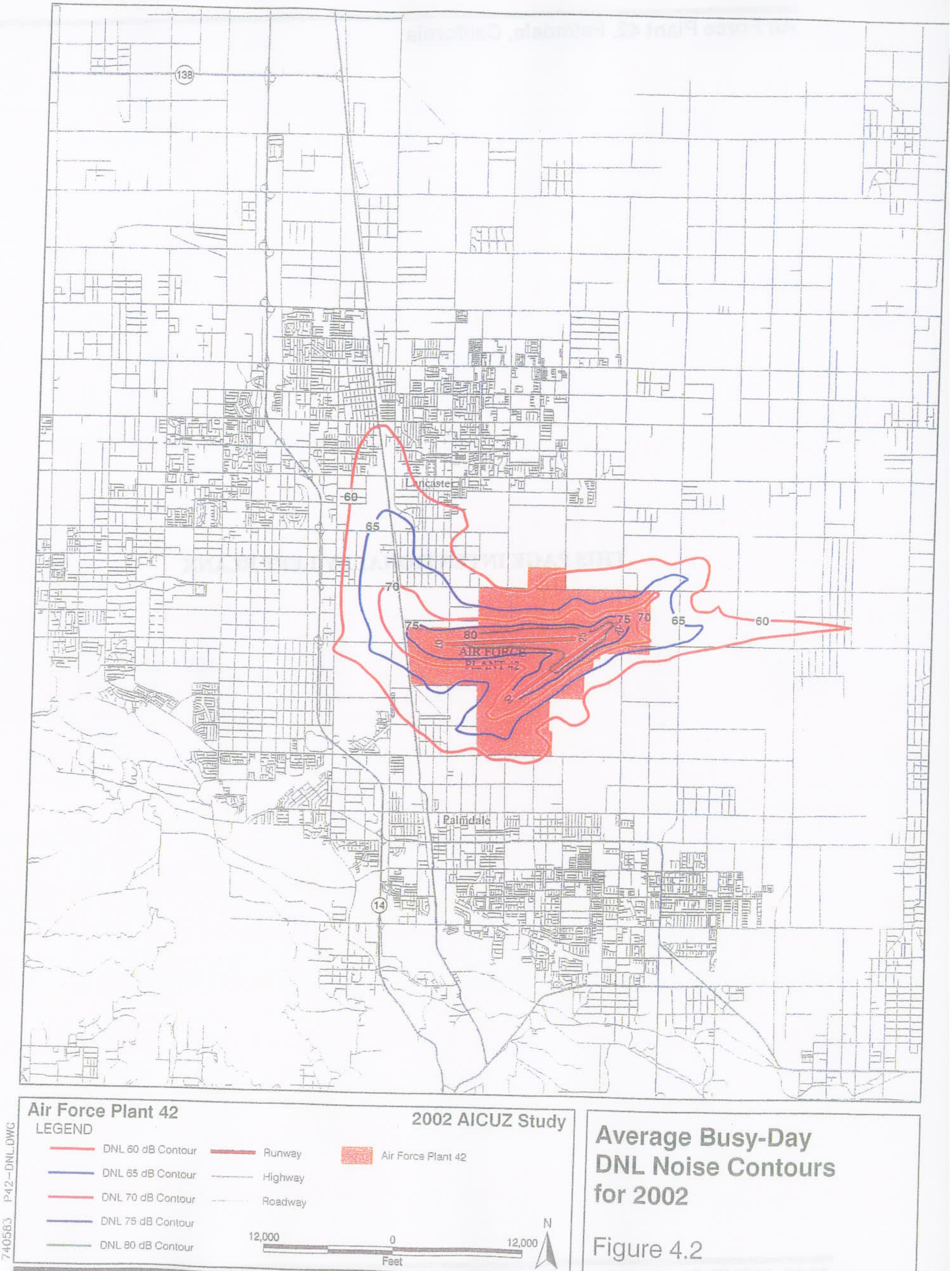
The land areas outlined by these criteria should be regulated to prevent uses that might otherwise be hazardous to aircraft operations. The following uses should be restricted and/or prohibited:

- Releases into the air of any substance that would impair visibility or otherwise interfere with the operation of aircraft (*e.g.*, steam, dust, or smoke);
- Light emissions, either direct or indirect (reflective), that would interfere with pilot vision;
- Electrical emissions that would interfere with aircraft communications systems or navigational equipment;
- Uses that would attract birds or waterfowl, including but not limited to, operation of sanitary landfills, maintenance of feeding stations, sand and gravel dredging operations, storm water retention ponds, created wetland areas, or the growing of certain vegetation; and
- Structures within 10 feet of aircraft approach-departure and/or transitional surfaces.

4.3 Noise Exposure

NOISEMAP Version 6.5 was used to calculate and plot the Day-Night Average A-Weighted Sound Level (DNL) 65 decibel (dB) through 80 dB noise contours based on the average busy day aircraft operations data collected in 2001 and described in Sections 3.1 through 3.6. Figure 4.2 shows the noise contours. The contours represent the composite noise resulting from the aircraft operations described in Table 3.2 and the flight tracks depicted in Figures 3.1 through 3.3. Figure 4.2 shows the 60 dB noise contour for comparison to the CNEL noise contours in Figure 4.3 even though AICUZ studies do not usually show levels below 65 dB. Air Force noise criteria, along with most other federal agency noise criteria, considers all land uses compatible with noise levels below DNL 65 dB. The remainder of the figures in the study do not show the DNL 60 dB contour. Figure 4.3 depicts the Community Noise Equivalent Level (CNEL) 60 dB through 80 dB noise contours.

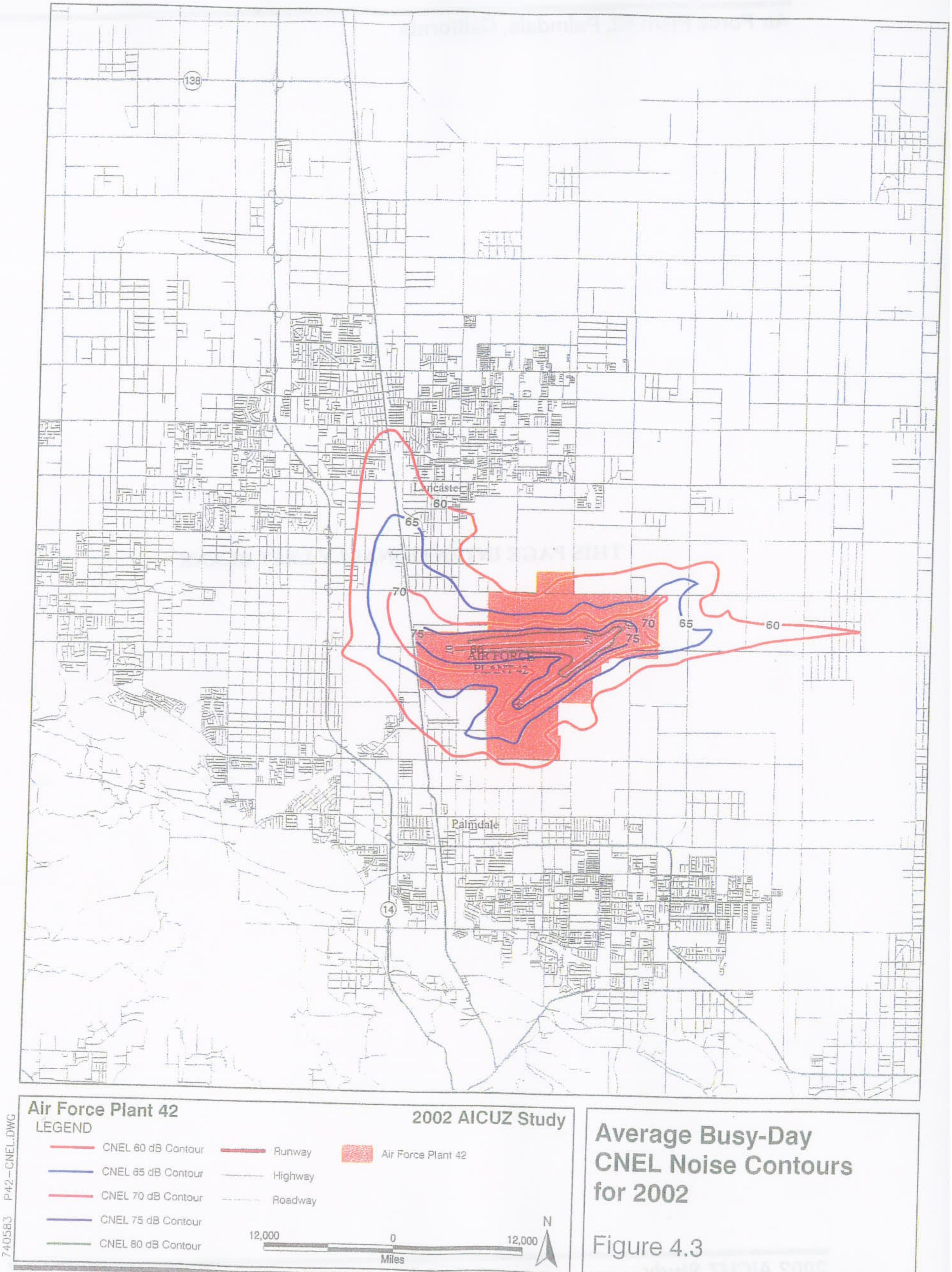
Different sounds have different frequency content. When describing sound and its effect on a human population, A-weighted (dB) sound levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the sound signal to emphasize frequencies in the middle of the audible spectrum and to de-emphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. This filtering network has been established by the American National Standards. The A-weighted



Average Busy-Day DNL Noise Contours for 2002

Figure 4.2

THIS PAGE INTENTIONALLY LEFT BLANK



Average Busy-Day CNEL Noise Contours for 2002

Figure 4.3

THIS PAGE INTENTIONALLY LEFT BLANK

noise level has been found to correlate well with people's judgments of the noisiness of different sounds and has been used for many years as a measure of community noise. Figure 4.4 depicts the typical A-weighted sound pressure levels for various sources. For example, 65 dB is equivalent to normal speech at a distance of 3 feet. Note that DNL and CNEL represent noise levels averaged over a 24-hour period (not single event noise).

Table 4.1 shows the off-installation noise exposure within the DNL 65 dB and greater noise exposure area for aircraft operations at Plant 42 in terms of acreage and estimated affected population. The population data used in preparing this estimate were obtained from the United States Census Bureau 2000 census. To estimate affected population, it was assumed that population was equally distributed within a block-group area. Using this assumption, the total acreage and population in each census block-group surrounding Plant 42 was collected and assessed. Using the noise contour information, the number of acres of land in each noise zone (*i.e.*, DNL 65-69 dB, 70-74 dB, 75-79 dB, and 80 dB and greater) was divided by the number of acres of land in each census block-group to determine what portion of the census block-group was contained within each noise zone. To determine population, the population total in each census block-group was then multiplied by this ratio to estimate affected population.

Table 4.1
Off-Installation Areas and Population Within DNL 65 dB and Greater Noise Exposure Area

DNL Noise Zone	Acres	Population
65–69	2,098	1,855
70–74	526	184
75–79	13	0
80+	0	0
Total	**2,637**	**2,039**

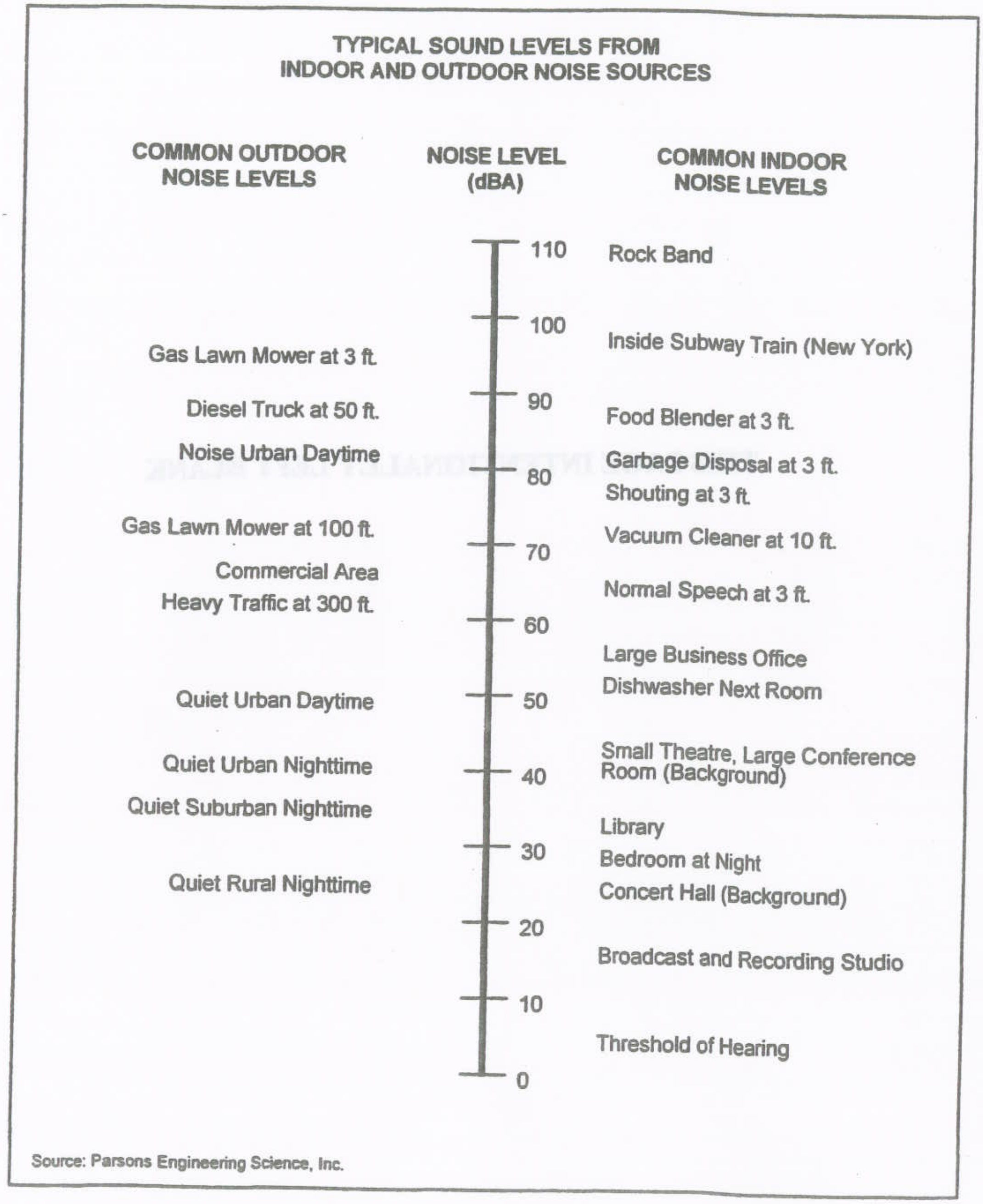
From Table 4.1, a total of 2,637 acres and 2,039 persons are expected to be in the off-installation area within the DNL 65 dB and greater noise exposure area. The largest affected population is anticipated to be within the DNL 65–69 dB noise zone. This area is estimated to contain 2,098 acres in off-installation land area (80 percent of the total) and an estimated population of 1,855 persons (91 percent of the total) based on U.S. Census Bureau calculated population densities for the area.

4.4 Comparison with 1990 AICUZ Study

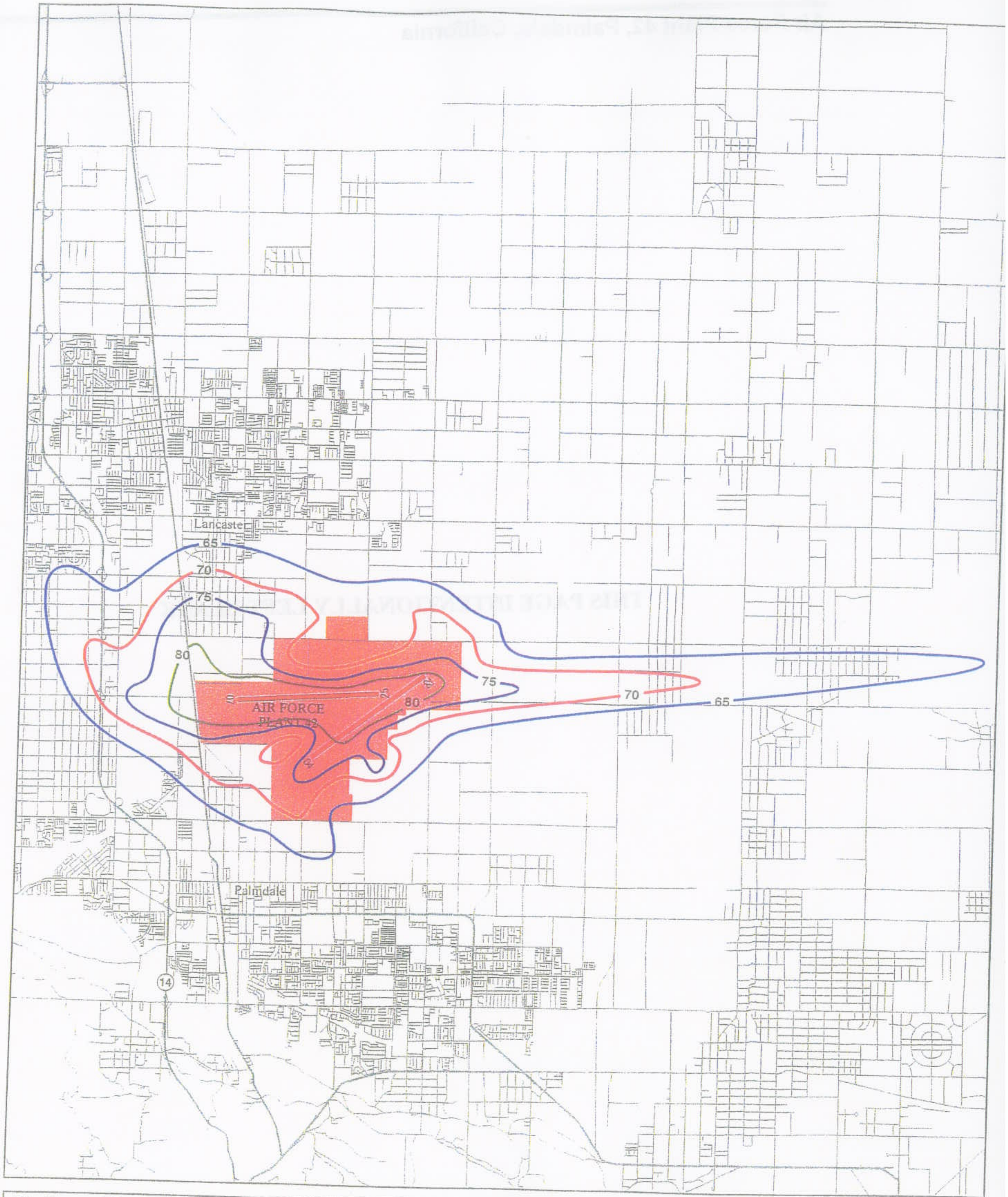
Noise contours presented in this study differ somewhat in both shape and extent from the noise contours in the 1990 AICUZ Study. Figure 4.5 depicts the 1990 AICUZ Study contours and Figure 4.6 compares the 2002 and 1990 contours.

THIS PAGE INTENTIONALLY LEFT BLANK

Figure 4.4
Typical A-Weighted Noise Comparisons



THIS PAGE INTENTIONALLY LEFT BLANK



Air Force Plant 42

LEGEND

- DNL 65 dB Contour
- DNL 70 dB Contour
- DNL 75 dB Contour
- DNL 80 dB Contour
- Runway
- Highway
- Roadway
- Air Force Plant 42

12,000 0 12,000
Feet

N

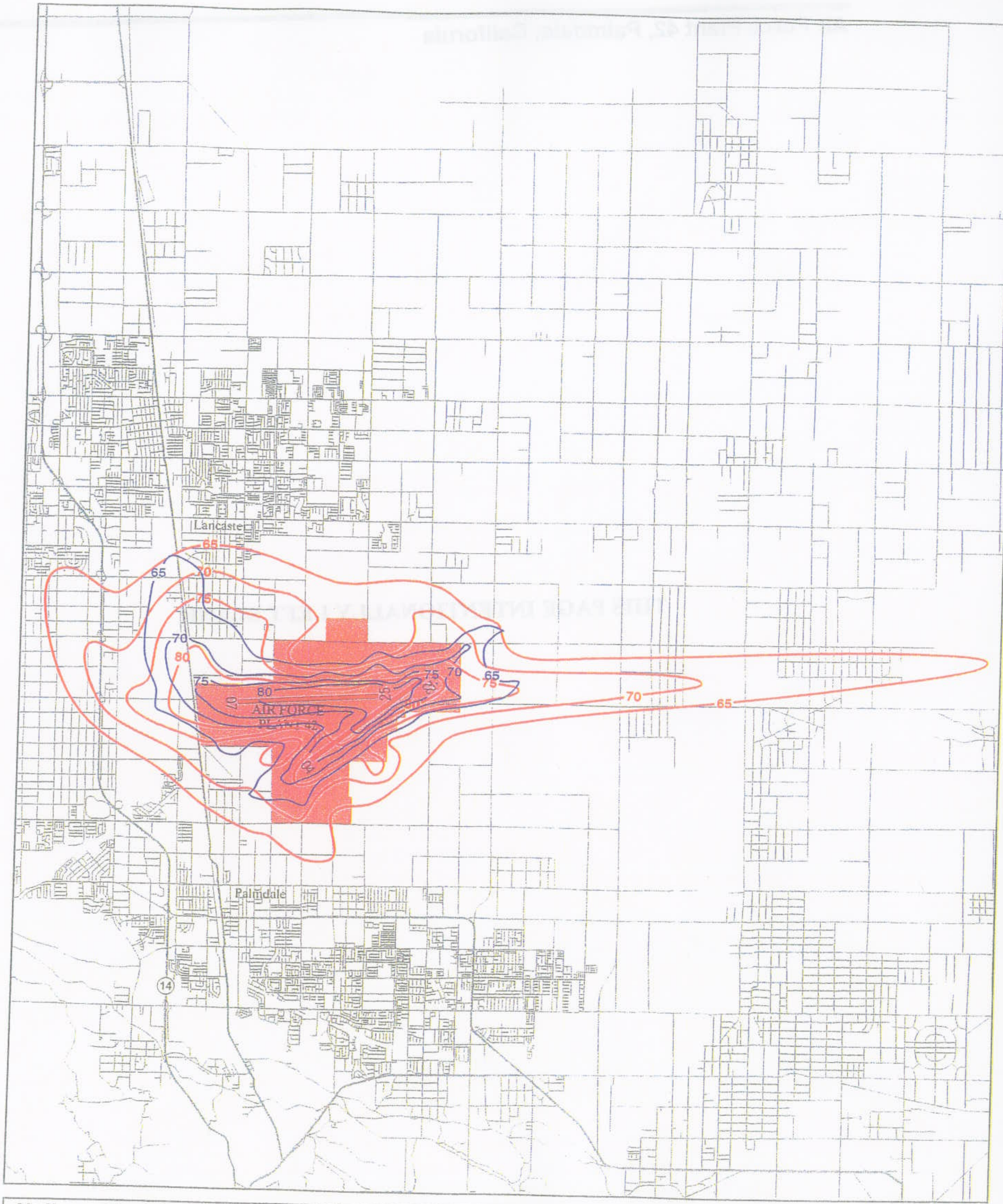
2002 AICUZ Study

740583 P42-1990.DWG

1990 AICUZ Study Noise Contours

Figure 4.5

THIS PAGE INTENTIONALLY LEFT BLANK



Air Force Plant 42

LEGEND

1990 DNL Noise Contours

2002 DNL Noise Contours

Runway

Highway

Roadway

Air Force Plant 42

12,000 0 12,000

Feet

N

2002 AICUZ Study

740583 P42-COMP.DWG

Comparison of 2002 and 1990 AICUZ Study Contours

Figure 4.6

THIS PAGE INTENTIONALLY LEFT BLANK

Noise exposure for this AICUZ Study is less than that for the 1990 AICUZ Study. Table 4.2 lists the total on and off installation noise exposure for the four noise zones in each study. Overall, noise exposure decreases in all quadrants around the airfield. As depicted on Figure 4.6, the primary areas where the noise exposure is less are east of Runway 07/25, north of the airfield, and west and northwest of the airfield beyond Sierra Highway. The reduction in noise exposure to the southeast, south, and southwest is not as extensive as in the other areas. The reduction in noise exposure is due to a different mix of aircraft that accomplish operations at the airfield. Additionally, the aircraft operating at the airfield in 2001 are more modern and have quieter engines than the aircraft in the 1990 study.

Table 4.2
Acres within the 2002 and 1990 Noise Zones

DNL Noise Zone	Acres	
	2002 Study	1990 Study
65–69	8,513	9,406
70–74	1,468	5,377
75–79	926	2,914
80+	600	2,112
Total	11,507	19,809

4.5 Clear Zones and Accident Potential Zones

The purpose of this section is to describe the basis for CZs and APZs and apply the zones to Plant 42.

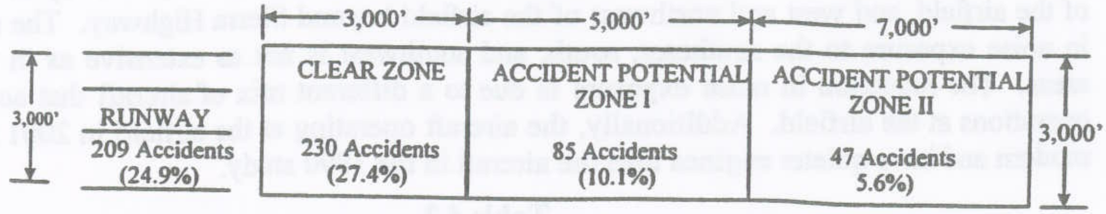
4.5.1 Basis for Clear Zones and Accident Potential Zones

Areas around airports are exposed to the possibility of aircraft accidents even with well-maintained aircraft and highly trained aircrews. Despite stringent maintenance requirements and countless hours of training, past history makes it clear that accidents are going to occur.

The risk of people on the ground being killed or injured by aircraft accidents is miniscule. However, an aircraft accident is a high-consequence event and, when a crash does occur, the result is often catastrophic. Because of this, the Air Force does not attempt to base its safety standards on accident probabilities. Instead it approaches this safety issue from a land-use-planning perspective. Designation of safety zones around the airfield and restriction of incompatible land uses can reduce the public's exposure to safety hazards.

The AICUZ program includes three safety zones: the CZ, APZ I, and APZ II. These zones were developed from analysis of over 800 major Air Force accidents that occurred within 10 miles of an Air Force installation between 1968 and 1995. Figure 4.7 summarizes the location of the accidents.

Figure 4.7
Air Force Aircraft Accident Data
(838 Accidents - 1968-1995)



Other Accidents Within 10 Nautical Miles: 267 Accidents, 32.0%

The CZ has the highest accident potential of the three zones, as 27 percent of accidents studied occurred in this area. Due to the relatively high accident potential, the Air Force adopted a policy of acquiring real estate interests in the CZ through purchase or easement.

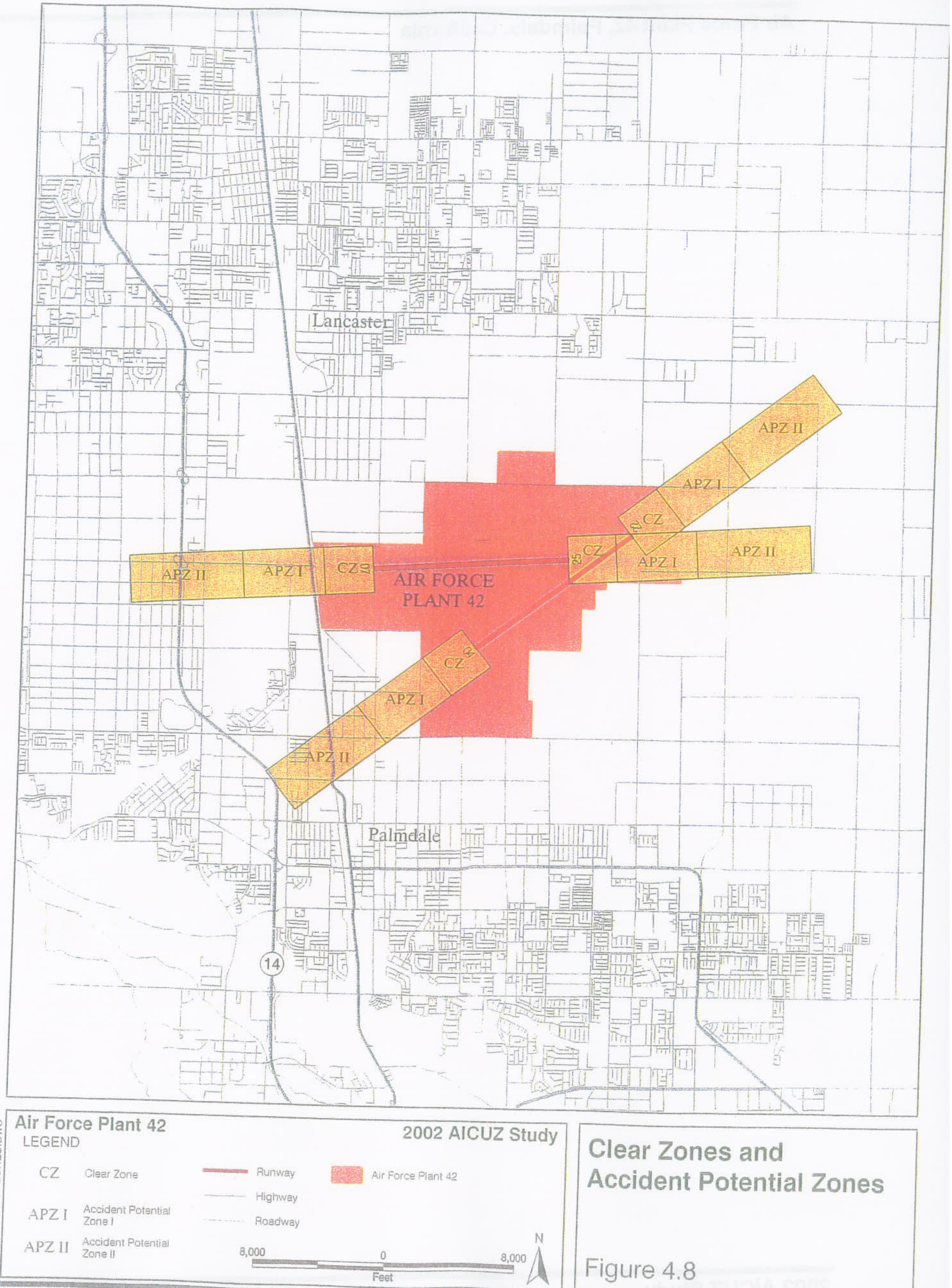
APZ I is an area that possesses somewhat less accident potential than the CZ with 10 percent of the accidents studied occurring in this zone. APZ II has less accident potential than APZ I with 6 percent of the accidents studied occurring in this zone. While the potential for aircraft accidents in APZs I and II does not warrant land acquisition by the Air Force, land-use planning and controls are strongly encouraged in these areas for the protection of the public.

4.5.2 Clear Zones and Accident Potential Zones for Plant 42

Figure 4.8 presents the CZs and APZs for the two runways at Plant 42. Each runway end at Plant 42 has a 3,000 foot by 3,000 foot CZ and two APZs. Accident potential on or adjacent to the runway or within the CZ is so high that the necessary land use restrictions would prohibit reasonable economic use of land. As stated previously, it is Air Force policy to request that Congress authorize and appropriate funds for the necessary real property interests in this area to prevent incompatible land uses. The Air Force owns all CZ areas at Plant 42.

Accident potential zone I is less critical than the CZ, but still possesses a significant risk factor. This 3,000 foot by 5,000 foot area has land use compatibility guidelines that are sufficiently flexible to allow reasonable economic use of the land, such as industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agriculture. However, uses that concentrate people in small areas are not acceptable.

Accident potential zone II is less critical than APZ I, but still possesses potential for accidents. Accident potential zone II, also 3,000 feet wide, is 7,000 feet long extending to 15,000 feet from the runway threshold. Acceptable uses include those of APZ I, as well as low density single family residential and those personal and business services and commercial/retail trade uses of low intensity or scale of operation. High density functions such as multistory buildings, places of assembly (theaters, churches, schools, restaurants, etc.), and high density office uses are not considered appropriate.



Clear Zones and Accident Potential Zones

Figure 4.8

THIS PAGE INTENTIONALLY LEFT BLANK

High people densities should be limited to the maximum extent possible. The optimum density recommended for residential usage (where it does not conflict with noise criteria) in APZ II is one dwelling per acre. For most nonresidential usage, buildings should be limited to one story and the lot coverage should not exceed 20 percent.

4.6 Land Use Compatibility Guidelines

Section 4.6.1 introduces the AICUZ concept, and Section 4.6.2 presents the land-use compatibility guidelines applicable to Plant 42.

4.6.1 Introduction

The Department of Defense (DoD) developed the AICUZ program for military airfields. Using this program at its installations, the DoD works to protect aircraft operational capabilities and to assist local government officials in protecting and promoting the public health, safety, and quality of life. The goal is to promote compatible land-use development around military airfields by providing information on aircraft noise exposure and accident potential.

AICUZ reports describe three basic types of constraints that affect, or result from, flight operations. The first constraint involves areas that the Federal Aviation Administration (FAA) and the DoD identified for height limitations (see Section 4.2).

The second constraint involves noise zones based on the DNL metric and the DoD NOISEMAP methodology. Using the NOISEMAP program, which is similar to FAA's Integrated Noise Model, the Air Force produces noise contours showing the noise levels generated by aircraft operations. The AICUZ report contains noise contours plotted in 5 dB increments, ranging from DNL 65 dB to 80+ dB.

The third constraint involves CZs and APZs based on statistical analysis of past DoD aircraft accidents. DoD analysis has determined that areas immediately beyond the ends of runways and along the approach and departure flight paths have greater potential for aircraft accidents (see Figure 4.7).

4.6.2 Land-Use Compatibility Guidelines

Each AICUZ Study contains land-use guidelines. Table 4.3 identifies land uses and possible noise exposure and accident potential combinations for Plant 42. These noise guidelines are essentially the same as those published by the Federal Interagency Committee on Urban Noise in the June 1980 publication, *Guidelines for Considering Noise in Land-Use Planning and Control.* The U.S. Department of Transportation publication, *Standard Land Use Coding Manual (SLUCM),* has been used to identify and code land-use activities.

Table 4.3
Land Use Compatibility Guidelines

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65-69	70-74	75-79	80+
10	**Residential**							
11	Household units							
11.11	Single units; detached	N	N	Y[1]	A[11]	B[11]	N	N
11.12	Single units; semidetached	N	N	N	A[11]	B[11]	N	N
11.13	Single units; attached row	N	N	N	A[11]	B[11]	N	N
11.21	Two units; side-by-side	N	N	N	A[11]	B[11]	N	N
11.22	Two units; one above the other	N	N	N	A[11]	B[11]	N	N
11.31	Apartments; walk up	N	N	N	A[11]	B[11]	N	N
11.32	Apartments; elevator	N	N	N	A[11]	B[11]	N	N
12	Group quarters	N	N	N	A[11]	B[11]	N	N
13	Residential hotels	N	N	N	A[11]	B[11]	N	N
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	A[11]	B[11]	C[11]	N
16	Other residential	N	N	N[1]	A[11]	B[11]	N	N
20	**Manufacturing**							
21	Food & kindred products; manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
22	Textile mill products; manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
23	Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing	N	N	N[2]	Y	Y[12]	Y[13]	Y[14]
24	Lumber and wood products (except furniture); manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
25	Furniture and fixtures; manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
26	Paper & allied products; manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
27	Printing, publishing, and allied industries	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
28	Chemicals and allied products; manufacturing	N	N	N[2]	Y	Y[12]	Y[13]	Y[14]
29	Petroleum refining and related industries	N	N	Y	Y	Y[12]	Y[13]	Y[14]
30	**Manufacturing**							
31	Rubber and misc. plastic products, manufacturing	N	N[2]	N[2]	Y	Y[12]	Y[13]	Y[14]
32	Stone, clay and glass products manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65-69	70-74	75-79	80+
33	Primary metal industries	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
34	Fabricated metal products; manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks manufacturing	N	N	N[2]	Y	A	B	N
39	Miscellaneous manufacturing	N	Y[2]	Y[2]	Y	Y[12]	Y[13]	Y[14]
40	**Transportation, communications and utilities**							
41	Railroad, rapid rail transit and street railroad transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
42	Motor vehicle transportation	N[3]	Y	Y	Y	Y[12]	Y[13]	Y[14]
43	Aircraft transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
44	Marine craft transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
45	Highway & street right-of-way	N[3]	Y	Y	Y	Y[12]	Y[13]	Y[14]
46	Automobile parking	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
47	Communications	N[3]	Y[4]	Y	Y	A[15]	B[15]	N
48	Utilities	N[3]	Y[4]	Y	Y	Y	Y[12]	Y[13]
49	Other transportation communications and utilities	N[3]	Y[4]	Y	Y	A[15]	B[15]	N
50	**Trade**							
51	Wholesale trade	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
52	Retail trade-building materials, hardware and farm equipment	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
53	Retail trade-general merchandise	N	N[2]	Y[2]	Y	A	B	N
54	Retail trade-food	N	N[2]	Y[2]	Y	A	B	N
55	Retail trade-automotive, marine craft, aircraft and accessories	N	Y[2]	Y[2]	Y	A	B	N
56	Retail trade-apparel and accessories	N	N[2]	Y[2]	Y	A	B	N
57	Retail trade-furniture, home furnishings and equipment	N	N[2]	Y[2]	Y	A	B	N

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65-69	70-74	75-79	80+
58	Retail trade-eating and drinking establishments	N	N	N[2]	Y	A	B	N
59	Other retail trade	N	N[2]	Y[2]	Y	A	B	N
60	**Services**							
61	Finance, insurance and real estate services	N	N	Y[6]	Y	A	B	N
62	Personal services	N	N	Y[6]	Y	A	B	N
62.4	Cemeteries	N	Y[7]	Y[7]	Y	Y[12]	Y[13]	Y[14,21]
63	Business services	N	Y[8]	Y[8]	Y	A	B	N
64	Repair services	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
65	Professional services	N	N	Y[6]	Y	A	B	N
65.1	Hospitals, nursing homes	N	N	N	A*	B*	N	N
65.1	Other medical facilities	N	N	N	Y	A	B	N
66	Contract construction services	N	Y[6]	Y	Y	A	B	N
67	Governmental services	N	N	Y[6]	Y*	A*	B*	N
68	Educational services	N	N	N	A*	B*	N	N
69	Miscellaneous services	N	N[2]	Y[2]	Y	A	B	N
70	**Cultural, entertainment and recreational**							
71	Cultural activities (including churches)	N	N	N[2]	A*	B*	N	N
71.2	Nature exhibits	N	Y[2]	Y	Y*	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	A	B	N	N
72.11	Outdoor music shell, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	N	N	N	Y[17]	Y[17]	N	N
73	Amusements	N	N	Y[8]	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y[8,9,10]	Y	Y*	A*	B*	N
75	Resorts and group camps	N	N	N	Y*	Y*	N	N
76	Parks	N	Y[8]	Y[8]	Y*	Y*	N	N
79	Other cultural, entertainment and recreation	N	Y[9]	Y[9]	Y*	Y*	N	N
80	**Resources production and extraction**							
81	Agriculture (except livestock)	Y[16]	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
81.5 to 81.7	Livestock farming and animal breeding	N	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65-69	70-74	75-79	80+
82	Agricultural related activities	N	Y[5]	Y	Y[18]	Y[19]	N	N
83	Forestry activities and related services	N[5]	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
84	Fishing activities and related services	N[5]	Y[5]	Y	Y	Y	Y	Y
85	Mining activities and related services	N	Y[5]	Y	Y	Y	Y	Y
89	Other resources production and extraction	N	Y[5]	Y	Y	Y	Y	Y

LEGEND

SLUCM - Standard Land Use Coding Manual, U.S. Department of Transportation.

Y - (Yes) - Land use and related structures are compatible without restriction.

N - (No) - Land use and related structures are not compatible and should be prohibited.

Y^x - (yes with restrictions) - Land use and related structures generally compatible; see notes 1-21.

N^x - (no with exceptions) - See notes 1-21.

NLR - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

A, B, or C - Land use and related structures generally compatible; measures to achieve NLR of A (DNL/CNEL 25 dB), B (DNL/CNEL 30 dB), or C (DNL/CNEL 35 dB) need to be incorporated into the design and construction of structures.

A^*, B^*, and C^* - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

* - The designation of these uses as "compatible" in this zone reflects individual federal agency and program consideration of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

NOTES

1. Suggested maximum density of 1-2 dwelling units per acre possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent.
2. Within each land use category, uses exist where further definition may be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible in any accident potential zone (CZ, APZ I, or APZ II).
3. The placing of structures, buildings, or aboveground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited. See AFI 32-7063 and UFC 3-260-01 for specific guidance.
4. No passenger terminals and no major aboveground transmission lines in APZ I.
5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.
7. Excludes chapels.
8. Facilities must be low intensity.
9. Clubhouse not recommended.
10. Areas for gatherings of people are not recommended.

11a. Although local conditions may require residential use, it is discouraged in DNL/CNEL 65-69 dB and strongly discouraged in DNL/CNEL 70-74 dB. An evaluation should be conducted prior to approvals, indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones, and there are no viable alternative locations.

11b. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor NLR for DNL/CNEL 65-69 dB and DNL/CNEL 70-74 dB should be incorporated into building codes and considered in individual approvals.

11c. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.

12. Measures to achieve the same NLR as required for facilities in the DNL/CNEL 65-69 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

13. Measures to achieve the same NLR as required for facilities in the DNL/CNEL 70-74 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

14. Measures to achieve the same NLR as required for facilities in the DNL/CNEL 75-79 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

15. If noise sensitive, use indicated NLR; if not, the use is compatible.

16. No buildings.

17. Land use is compatible provided special sound reinforcement systems are installed.

18. Residential buildings require the same NLR required for facilities in the DNL/CNEL 65-69 dB range.

19. Residential buildings require the same NLR required for facilities in the DNL/CNEL 70-74 dB range.

20. Residential buildings are not permitted.

21. Land use is not recommended. If the community decides the use is necessary, personnel should wear hearing protection devices.

4.7 Participation in the Planning Process

The Air Force provides the AICUZ Study to local communities to assist them in preparing local land use plans. This section discusses how the Plant 42 participates in the community planning process. Section 6.3 addresses the role played by the local community in enhancing compatible land use.

Airspace obstructions, construction in the APZs, residential development, and the construction of other noise-sensitive uses near the installation are of great concern to Plant 42. Incompatible land use is discussed Section 5. The Air Force is very interested in minimizing increases in incompatible usage and in encouraging voluntary conversion of non-compatible usage to compatible usage. Applying the categories for compatible land use described in Table 4.3, the installation evaluates the impact that aircraft operations have on surrounding properties and the effect new development or changes in land use might have on operational capabilities. Participation in land-use planning can take many forms. The simplest of these is straightforward, consistent two-way discussion and information sharing with both professionals and neighbors. Copies of the AICUZ Study, including maps, will be provided to local planning departments and zoning administrators. Through this communication process, the local governments review applications for development or changed use of properties within the noise impact and safety areas, as well as other nearby parcels. The installation coordinates closely with surrounding communities and Los Angeles County on zoning and land-use issues.

In addition to working with local governing entities and planning professionals, the Plant 42 Commander and AICUZ program manager work to address complaints and concerns expressed by off-installation neighbors.

The installation conducts active outreach to the community by meeting with various community groups and speaking with individuals as needed. The Plant 42 Commander and AICUZ program manager work together in providing public meetings and informational workshops to disseminate information about operations, forecasts, plans, and mitigation strategies.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 5
LAND USE ANALYSIS

5.1 Introduction

Land use planning and control is a dynamic, rather than a static process. The specific characteristics of land use determinants will always reflect, to some degree, the changing conditions of the economic, social, and physical environment of a community, as well as changing public concern. The planning process accommodates this fluidity in which decisions are normally not based on boundary lines, but rather on more generalized area designations.

Plant 42 was originally established in a relatively undeveloped area in Los Angeles County, California. In recent years, however, development has increased primarily to the north, west, and south of the installation.

Computer technology has enabled Plant 42 to more precisely display its flight tracks and noise contours for land use planning purposes. Computer technology reveals the extent of the Plant 42 region of impact into Los Angeles County and surrounding nearby cities and towns.

For the purpose of this study, existing land uses have been classified into one of the following five categories:

Residential: Includes all types of residential units, such as single and multi-family residences and mobile homes, at a density greater than one dwelling unit per acre.

Commercial: Includes offices, retail, restaurants, and other types of commercial establishments.

Industrial: Includes manufacturing, warehousing, and other similar uses.

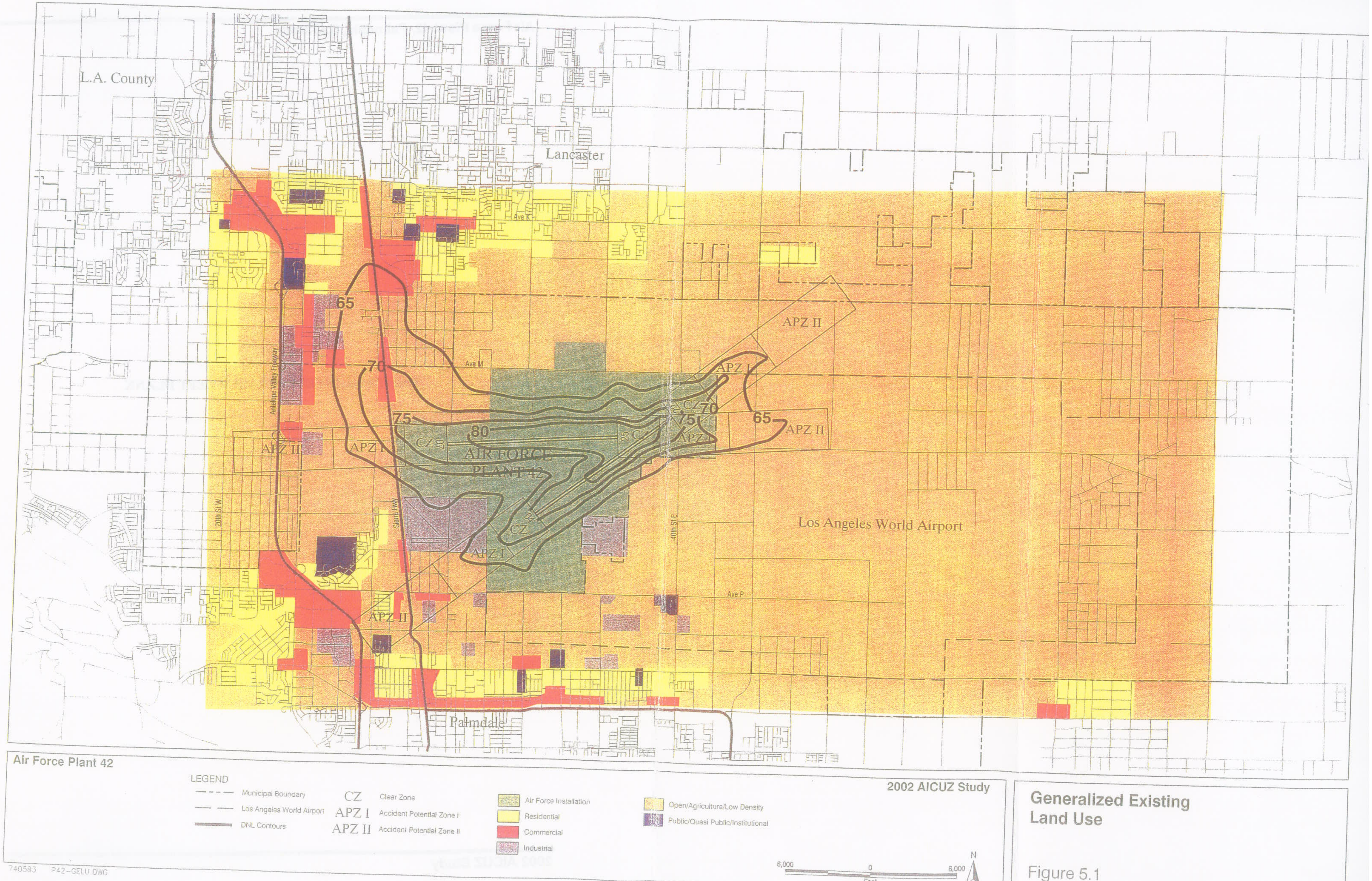
Public/Quasi-Public: Includes publicly owned lands and/or land to which the public has access, including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals.

Open/Agricultural/Low Density: Includes undeveloped land areas, agricultural areas, grazing lands, and areas with residential units at densities less than or equal to one dwelling unit per acre.

5.2 Existing Land Use

Existing land uses in the vicinity of Plant 42 are shown in Figure 5.1. Two municipalities, Palmdale and Lancaster, contain the majority of land within the AICUZ area of influence. Land under the jurisdiction of Los Angeles County is interspersed among the surrounding

THIS PAGE INTENTIONALLY LEFT BLANK



2002 AICUZ Study

Generalized Existing Land Use

Figure 5.1

THIS PAGE INTENTIONALLY LEFT BLANK

communities, predominantly to the east and west of Plant 42. Approximately 17,000 acres of land directly east of Plant 42 are under control of the City of Los Angeles. This property is managed by Los Angeles World Airports (LAWA), which owns and leases property surrounding Plant 42.

The area around Plant 42 experienced significant growth swings over the past several decades. During the 1980s, the area experienced a boom in residential growth followed by an increase in commercial development necessary to serve new residents. In the early 1990s, the area experienced a significant drop in the rate of development. Throughout the mid and late 1990s, the area experienced slow but steady growth that continues today.

Land uses in the vicinity of Plant 42 are generally a mix of developed urban to the north and south, open agricultural to the east, and low density urban to the west. Land uses to the west of Plant 42 are most impacted by flight operations.

5.2.1 Palmdale

The City of Palmdale surrounds Plant 42 to the north, extreme east, and south. Land to the north of Plant 42, between Avenue L and Avenue M, is principally undeveloped with a few mobile and single family residential homes scattered throughout the area. Land to the southwest of Plant 42 contains low to medium density urban development, mostly a mix of commercial and residential.

The most intensely developed commercial areas within the AICUZ area of influence include the land between Avenue Q and Palmdale Boulevard. A large commercial center, the Antelope Valley Mall, is located just northwest of the Runway 04 accident potential zone II (APZ II). The Antelope Valley Country Club is located directly northeast of the mall and is surrounded by a single family residential development. Sporadic commercial and light industrial development exists along Sierra Highway, which parallels a major rail line. Airport-related industrial uses are located directly south of Plant 42 and include Lockheed-Martin Aeronautics and SR Technics America.

5.2.2 Lancaster

The City of Lancaster boundary abuts Plant 42 to the north and northwest. Additional land under the jurisdiction of Lancaster is located beyond Avenue L to the north of the installation. Land uses between Avenue J and Avenue L are chiefly single family residential, with decreasing densities north to south, approaching the Plant 42 boundary. Land northwest of Plant 42 in the vicinity of Sierra Highway is generally comprised of small-scale industrial uses intermixed with older low-density residential uses. Downtown Lancaster is located north of Plant 42, defined by Avenue I, Avenue J, Sierra Highway, and 10th Street West. This area contains several public facilities, general commercial, and high density residential uses.

5.2.3 Los Angeles County

Portions of land that fall within unincorporated Los Angeles County are also located in the Plant 42 AICUZ area of influence. The largest tract of Los Angeles County land exists west of the installation between Avenue M and Avenue P, west of 10th Street West. This area is almost exclusively developed with low-density residential homes at a density of between 0.5 and 1 dwelling unit per acre. Per Air Force Compatibility Guidance, residential development of less than 1 unit per acre is classified as open/agricultural/low density.

The City of Los Angeles controls a large tract of land directly east of Plant 42 that is targeted as the future Palmdale Regional Airport. The land is currently undeveloped and consists of agricultural, gravel mining, and light industrial activities.

5.2.4 Summary

Figure 5.1 presents the existing land uses for the area that surrounds Plant 42 and within the DNL 65 dB and greater noise exposure area for the installation. Table 5.1 summarizes the acreage by land use category exposed to noise levels of DNL 65 dB and greater. Note that these acreages represent only the area outside the Plant 42 boundary.

Table 5.1
Generalized Existing Land Use Within DNL 65 dB and Greater Noise Exposure Area

Category	Acreage
Residential	0
Commercial	216
Industrial	73
Public/Quasi-public	0
Open/Agricultural/Low Density	2,348
Total	**2,637**

Source: Parsons 2002

The analysis also includes land use within the Plant 42 clear zones (CZs) and APZs. All four runway CZs are located entirely on Air Force property. As shown on Figure 5.1, the Plant 42 APZs extend farther into surrounding communities than do the areas affected by noise levels equal to or greater than DNL 65 dB. Inclusion of the APZs in the evaluation shows 358 acres of residential land within the Plant 42 APZs. Table 5.2 reflects the land use (off-installation areas only) within the Plant 42 APZs.

Table 5.2
Generalized Existing Land Use Within the Plant 42 Accident Potential Zones (Off-Installation)

Category	Acreage
Residential	45
Commercial	76
Industrial	145
Public/Quasi-public	34
Open/Agricultural/Low Density	2,550
Total	**2,850**

5.3 Source: Parsons 2002

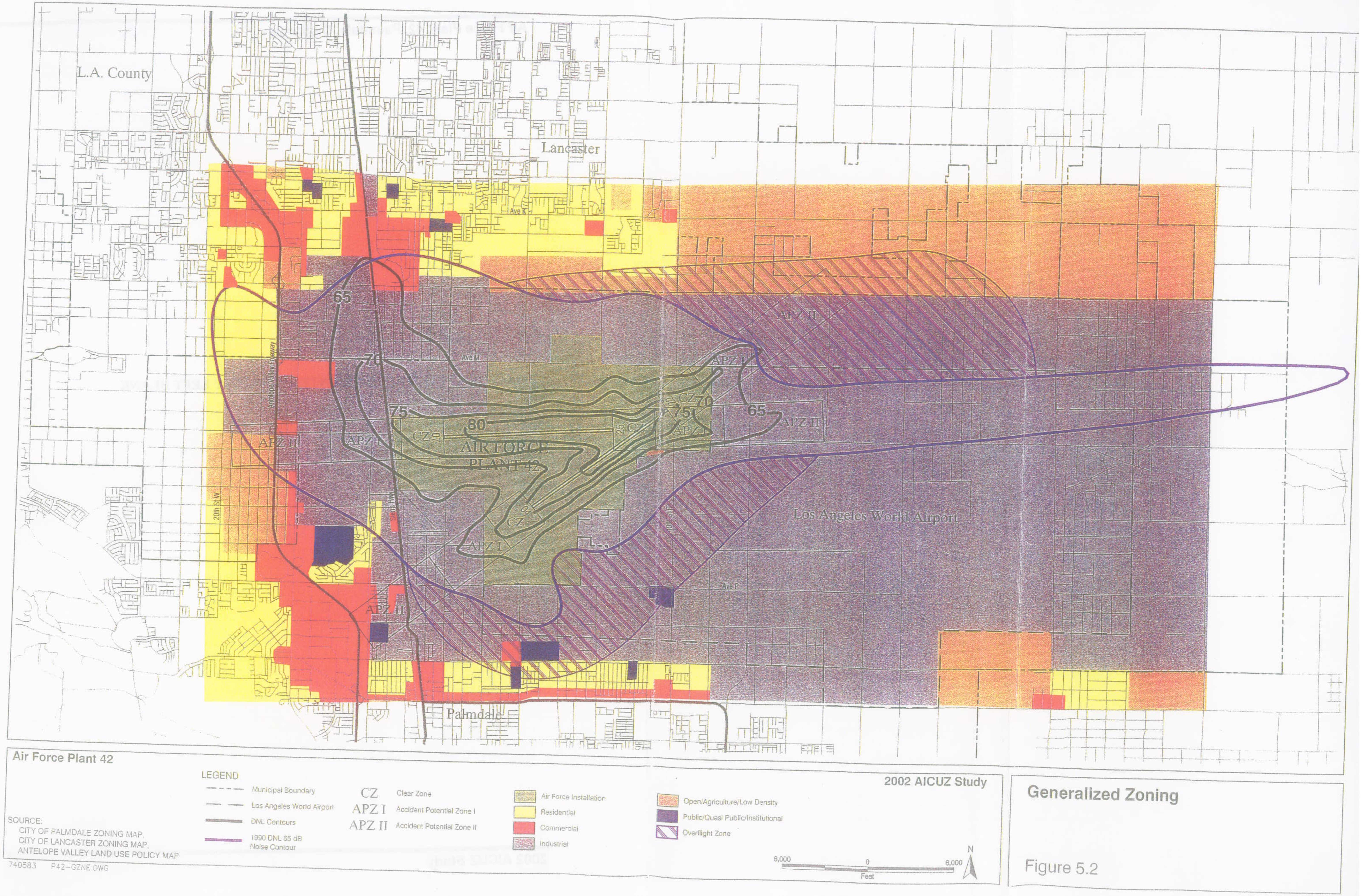
5.3 Current Zoning

Figure 5.2 overlays the 2002 noise contours and APZs on a map displaying the current generalized zoning in the vicinity of Plant 42. As described in the preceding existing land use section, the area of interest is limited to the communities of Palmdale and Lancaster and unincorporated lands within Los Angeles County.

The cities of Palmdale and Lancaster and Los Angeles County have adopted standard zoning ordinances and zoning maps to guide and control development. Lancaster and Palmdale use between 15-25 zoning classifications that have been generalized for AICUZ planning purposes.

In addition to local zoning criteria, the Air Force, City of Lancaster, City of Palmdale, and LAWA established a Joint Land Use Committee (JLUC) to organize and integrate into one document the various planning efforts and decisions relating to land use around Plant 42. The JLUC published a report in 1990 that provides land use policies and requires all local jurisdictions to apply JLUC recommendations to land use decisions in the vicinity of Plant 42. The JLUC report created an additional overflight zone (Figure 5.2) which identified an area below the most heavily used flight patterns flown at Plant 42 based on the 1990 AICUZ Study. While the JLUC report does include general recommendations consistent with AICUZ planning policy, the overflight zone is not a standard component of an Air Force AICUZ Study. As a member of the JLUC, the Air Force supported the desires of the local jurisdictions to provide this extra measure of protection. Other requirements of the JLUC report include a mandatory disclosure statement for all sales or transfers of land within the APZs. These statements indicate that the property is subject to frequent over flight and aircraft noise. The Air Force supports continued use of disclosure statements.

THIS PAGE INTENTIONALLY LEFT BLANK



Generalized Zoning

Figure 5.2

THIS PAGE INTENTIONALLY LEFT BLANK

5.3.1 Palmdale

The 1993 Palmdale General Plan includes a noise and safety component that incorporates recommendations related to Plant 42 aircraft noise and safety planning criteria. A goal of the Palmdale General Plan Noise component is to "Promote noise compatible land uses within the 65 CNEL contour and the Frequent Overflight Area of Air Force Plant 42." The General Plan contains objectives and polices that promote industrial, business park, and recreational uses compatible with Air Force planning requirements.

To further protect the Plant 42 airfield, Palmdale has zoned undeveloped land north of the installation between Avenue L and Avenue M for industrial uses. To the south of the installation, a buffer of industrial zoned land exists between Plant 42 and the residential and commercial uses adjacent to Palmdale Boulevard.

5.3.2 Lancaster

The City of Lancaster is predominantly zoned with a combination of commercial, residential, and industrial uses. The *1997 Lancaster General Plan* and adopted zoning include recommendations to maintain compatibility with Plant 42 operations. To maintain the long term viability of Plant 42, the City of Lancaster approved a *General Plan* amendment and zoning change to reduce allowed densities of development south of Avenue K-8 to improve land use compatibility with operations at Plant 42.

5.3.3 Los Angeles County

The Land Use Policy Map in the *Antelope Valley Areawide General Plan* designates several land use classifications for Los Angeles County land. The *General Plan* contains explanations for each land use category and policy related to the land use. Los Angeles County land located between Avenue M and Avenue P, west of the Antelope Valley Freeway, is zoned for low density residential (between 0.5 and 1 dwelling unit per acre). The City of Los Angeles owns a large tract of land immediately to the east of the Plant 42 boundary. This land is zoned for airport related industrial uses by the Los Angeles County Zoning Board.

5.3.4 Summary

Analysis of the current zoning maps for these jurisdictions was performed to determine the acreage of each zoning designation within the DNL 65 dB and greater noise area. For this analysis, zoning designations in each jurisdiction were generalized into residential, commercial, industrial, public/quasi-public, and open/agricultural categories. Figure 5.2 shows results of the compilation, and Table 5.3 provides a breakdown of the generalized zoning (off-installation areas only and outside APZs) within the DNL 65 dB and greater noise area.

Table 5.3
Current Zoning Within DNL 65 dB and Greater Noise Exposure Area (Off-Installation outside APZs)

Category	Acreage
Residential	0
Commercial	99
Industrial	1,877
Public/Quasi-public	0
Open/Agricultural/Low Density	13
Total	**1,989**

Sources: City of Lancaster Zoning Map
City of Palmdale Zoning Map
Los Angeles County Zoning Policy Map

A similar analysis was performed to determine the acreage of each generalized zoning category within the Plant 42 APZs and is shown on Table 5.4.

Table 5.4
Current Zoning Within the Plant 42 Accident Potential Zones (Off-Installation)

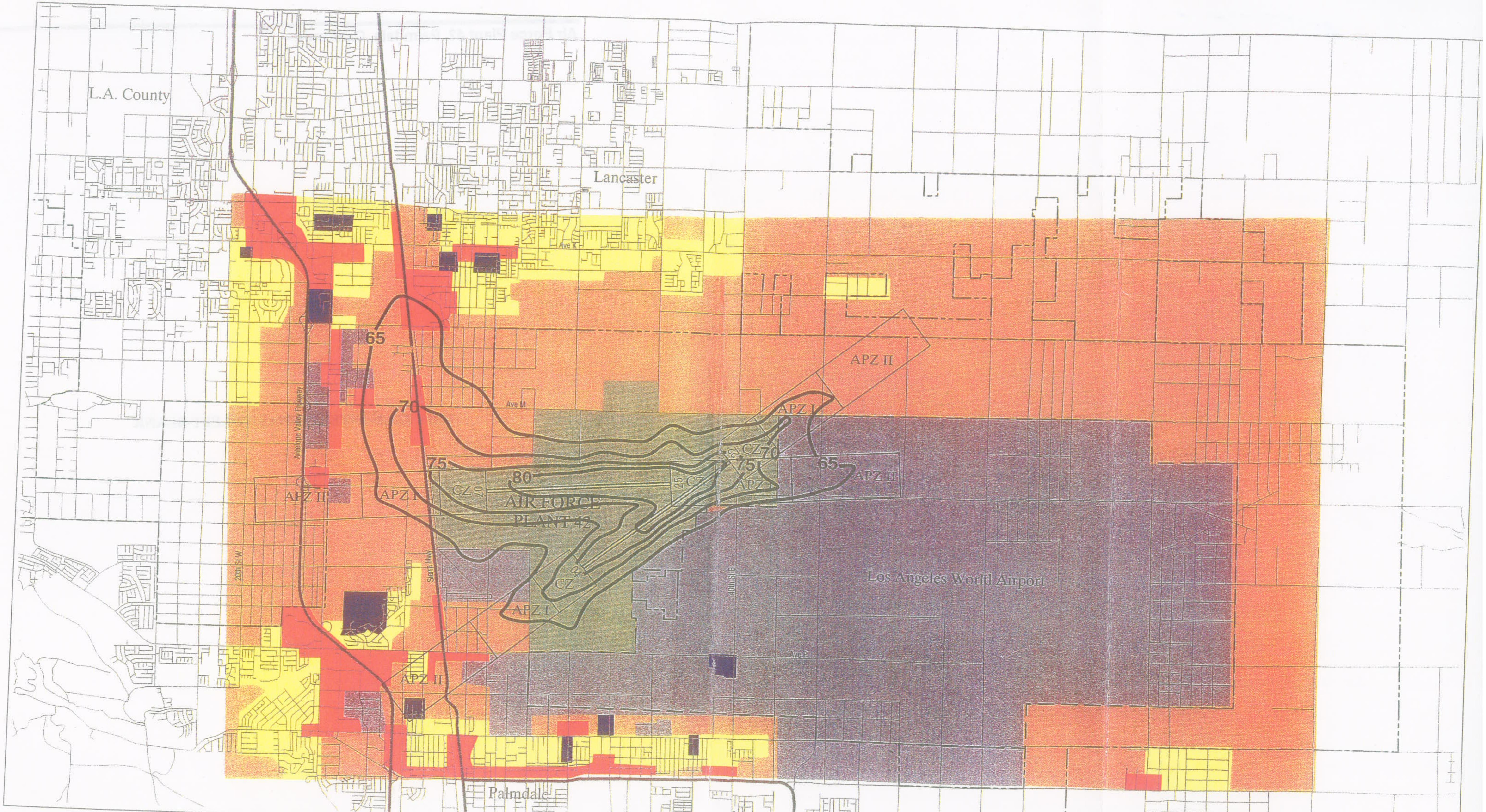
Category	Acreage
Residential	0
Commercial	128
Industrial	2,432
Public/Quasi-public	38
Open/Agricultural/Low Density	252
Total	**2,850**

Sources: City of Lancaster Zoning Map
City of Palmdale Zoning Map
Los Angeles County Zoning Policy Map

5.4 Future Land Use

Following a period of tremendous population growth during the 1980s, the area has experienced slower growth and less construction throughout the past decade. With a slowly improving economy, the region is expected to experience slow but steady growth over the next several years. Figure 5.3 projects area growth patterns over the next several years based on local zoning maps, general plans, and local development proposals. The following paragraphs discuss the anticipated future land use patterns.

It is important to note the inherent differences between the future land use areas shown in Figure 5.3 and the generalized zoning areas shown in Figure 5.2. Lancaster, Palmdale, and



Air Force Plant 42

SOURCE:
CITY OF PALMDALE ZONING MAP,
CITY OF LANCASTER ZONING MAP,
ANTELOPE VALLEY LAND USE POLICY MAP,
ANTELOPE VALLEY AREA WIDE GENERAL PLAN,
CITY OF LANCASTER GENERAL PLAN,
CITY OF PALMDALE GENERAL PLAN,
PALMDALE REGIONAL AIRPORT LAND USE DEV. STUDY

740583 P42–FUTR.DWG

LEGEND

- Municipal Boundary
- Los Angeles World Airport
- DNL Contours
- CZ Clear Zone
- APZ I Accident Potential Zone I
- APZ II Accident Potential Zone II
- Air Force Installation
- Residential
- Commercial
- Industrial
- Open/Agriculture/Low Density
- Public/Quasi Public/Institutional

6,000 0 6,000
Feet
N

2002 AICUZ Study

Generalized Future Land Use

Figure 5.3

THIS PAGE INTENTIONALLY LEFT BLANK

Los Angeles County use as many as 25 zoning classifications that have been generalized to five categories for the purposes of this study. This generalization may result in differences between "land use categories" shown on Figures 5.1 and 5.3 and "zoning classifications" shown on Figure 5.2. Additionally, both Palmdale and Lancaster have recently rezoned land surrounding Plant 42 to industrial or low density uses to further protect the Plant 42 airfield from incompatible future development. However, the majority of this land is categorized as open/agricultural/low density on the future land use map since new development is not anticipated for several years.

5.4.1 Palmdale

Palmdale is expected to experience moderate growth over the next several years. Residential growth in the vicinity of Plant 42 should not be significant and is most likely to occur south of Palmdale Boulevard outside the AICUZ area of influence. Moderate commercial development is anticipated along the Palmdale Boulevard corridor. The Palmdale Trade and Commerce Center (PT&CC) is located between Avenue P to the north, 10th Street West to the west, Palmdale Boulevard to the south, and Division Street to the east. This commercial area should see additional retail, restaurants, and related development. The Antelope Valley Auto Center, a master planned retail automotive sales and leasing center surrounded by the PT&CC, should also experience additional development. There will likely be small amounts of growth in the aerospace research and development sectors that will result in additional development of industrial uses surrounding Plant 42. Land along Amargosa Creek between Sierra Highway and 10th Street is severely constrained by floodplain. Development of this area is contingent on major flood control improvements.

Significant areas of land under the jurisdiction of Palmdale surround the proposed regional airport land. Much of this industrially designated land will remain vacant for the long range until such a time that a regional airport becomes feasible. To provide access to the future regional airport from the greater Los Angeles area, the California Department of Transportation is considering re-routing Highway 138 to an alignment along Avenue P-8. Development of the regional airport and realignment of Highway 138 would result in additional commercial and industrial development along the highway and surrounding Plant 42 area.

5.4.2 Lancaster

The City of Lancaster is expected to experience modest growth in both residential and commercial development in the vicinity of Plant 42. Moderate residential development is anticipated along Avenue K, between 10th Street East and 40th Street East. Commercial and light industrial development is anticipated along 10th Street West in the vicinity of Avenue M and Avenue N. Additional commercial growth will likely occur on both sides of the Antelope Valley Freeway between Avenue I and Avenue L. The city's adopted zoning should limit residential growth to low density, rural, compatible development south of Avenue K-8, directly north of Plant 42.

5.4.3 Los Angeles County

A large tract of land that is owned by the City of Los Angeles is directly east of Plant 42. This land falls within the Los Angeles County zoning authority. The LAWA has identified this parcel as a potential regional airport to reduce air traffic at LAX. It is anticipated that this will occur only after 400 commercial aircraft operations per day are achieved as per the current Plant 42 joint use agreement, which will not occur in the short range. The future airport land is located in the vicinity of Avenue M, 30th Street East, Avenue P-12, and 100th Street East. Although aircraft passenger and cargo demand are currently very low at Palmdale, in the long range if the proposed regional airport is developed, it is anticipated that this area will then have demands for commercial and industrial development east of Plant 42. No significant growth is anticipated on the remaining Los Angeles County land within the AICUZ area of influence.

5.5 Incompatible Land Uses

Table 4.3 shows land use compatibility as it is applied to existing land use within the Plant 42 area of influence. For a land use area to be considered compatible, it must meet criteria for its category for both noise and accident potential as shown in Table 4.3.

The compatibility guidelines shown in Table 4.3 were combined with the existing land use data presented on Figure 5.1 to determine land use compatibility associated with aircraft operations at Plant 42. Results of this analysis are shown numerically in Table 5.5 and graphically on Figure 5.4. All four runway CZs are located on Air Force property. The APZs for Runway 22 and Runway 25 are compatibly located within open/agricultural/low density use areas. The Runway 04 and Runway 07 APZs fall within low-density development areas, but do exhibit minimal incompatibility related to the types and densities of uses.

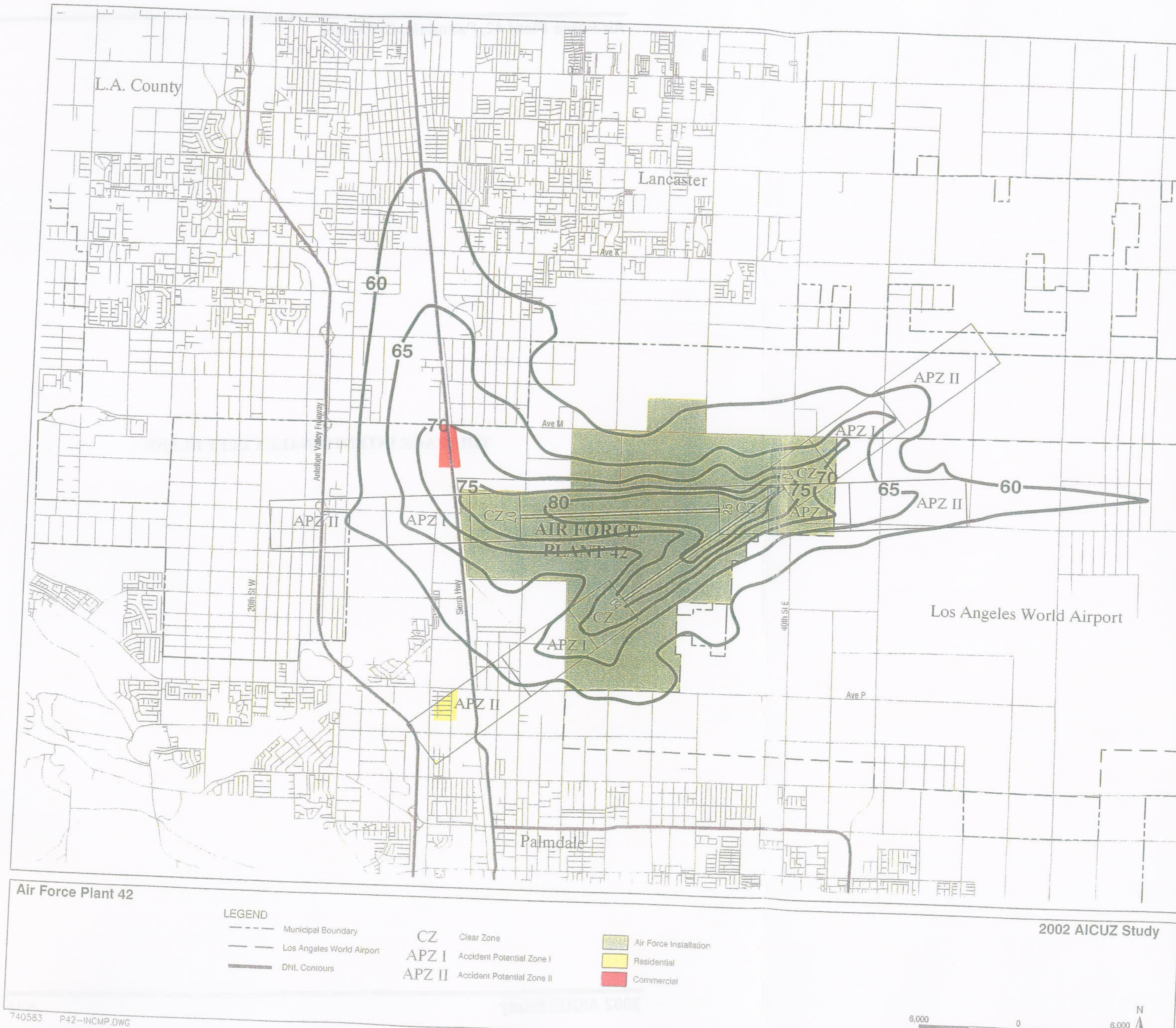
5.5.1 Runway 07 Approach Clear Zones and Accident Potential Zones (West of the Airfield)

5.5.1.1 Runway 07 Clear Zone

The Air Force owns all land within the Runway 07 CZ. All the land within the CZ is open space compatible with Air Force planning criteria.

5.5.1.2 Runway 07 Accident Potential Zone I

Land use within the Runway 07 APZ I is predominantly open space and compatible with Air Force planning criteria.



2002 AICUZ Study

Incompatible Land Uses

Figure 5.4

THIS PAGE INTENTIONALLY LEFT BLANK

Table 5.5
Incompatible Land Use for Plant 42

Category	Acreage Within APZs			Acreage Within Noise Zones, Not Included in APZs				
	CLEAR ZONE	APZ I	APZ II	65-69	70-74	75-79	80+	Total
Residential	0	0	45	0	0	0	0	45
Commercial	0	0	•	•	64	0	0	64
Industrial	0	•	•	•	•	•	0	0
Public/Quasi-public	0	0	0	•	0	0	0	0
Open/Agricultural /Low Density	•	•	•	•	•	•	•	0
Total	0	0	45	0	64	0	0	109

• Represents compatible land use

Source: Parsons 2002

5.5.1.3 Runway 07 Accident Potential Zone II

Most categories of land use are compatible with the safety criteria established for APZ II with the exception of public/quasi-public and some densities of residential. If residential densities are greater than one dwelling unit per acre, these land uses would be incompatible. The residential lands in this APZ are low density (less than one dwelling unit per acre) and considered to be compatible land uses.

5.5.2 Runway 25 Approach Clear Zones and Accident Potential Zones (East of the Airfield)

5.5.2.1 Runway 25 Clear Zone

The Air Force owns all land within the Runway 25 CZ. All the land within the CZ is open space compatible with Air Force planning criteria.

5.5.2.2 Runway 25 Accident Potential Zone I

In general, industrial, recreational, vacant, and agricultural/open land uses are compatible with the safety criteria established for APZ I. Land uses in this APZ area are entirely open/agricultural/low density and are considered to be compatible land uses.

5.5.2.3 Runway 25 Accident Potential Zone II

Most categories of land use are compatible with the safety criteria established for APZ II with the exception of public/quasi-public and some densities of residential. Land uses in this APZ area are entirely open/agricultural/low density and are considered to be compatible land uses.

5.5.3 Runway 04 Approach Clear Zones and Accident Potential Zones (Southwest of the Airfield)

5.5.3.1 Runway 04 Clear Zone

The Air Force owns all land within the Runway 04 CZ. All the land within the CZ is open space compatible with Air Force planning criteria.

5.5.3.2 Runway 04 Accident Potential Zone I

In general, industrial, recreational, vacant, and agricultural/open land uses are compatible with the safety criteria established for APZ I. Land uses within Runway 04R APZ I are predominantly open space. No incompatible land uses occur in this area.

5.5.3.3 Runway 04 Accident Potential Zone II

Most categories of land use are compatible with the safety criteria established for APZ II with the exception of public/quasi-public and some densities of residential. If residential densities are greater than one dwelling unit per acre (as is the case in the areas shown on Figure 5.4), these land uses would be incompatible. The Runway 04 APZ II contains a few residential units east of Division Street, between Avenue P and Avenue Q, which slightly exceed the recommended density limits and are considered to be incompatible uses.

5.5.4 Runway 22 Approach Clear Zones and Accident Potential Zones (Northeast of the Airfield)

5.5.4.1 Runway 22 Clear Zone

The Air Force owns all land within the Runway 22 CZ. All of the land within the CZ is open space compatible with Air Force planning criteria.

5.5.4.2 Runway 22 Accident Potential Zone I

In general, industrial, recreational, vacant, and agricultural/open land uses are compatible with the safety criteria established for APZ I. Land uses in this APZ area are entirely open/agricultural/low density and are considered to be compatible land uses.

5.5.4.3 Runway 22 Accident Potential Zone II

Most categories of land use are compatible with the safety criteria established for APZ II with the exception of public/quasi-public and some densities of residential. Land uses in this APZ area are entirely open/agricultural/low density and are considered to be compatible land uses.

5.6 Noise Zones

Only limited DNL 65-69 dB and 70-74 dB noise contours extend beyond the boundaries of Plant 42, occurring northwest of the installation along Sierra Highway. At noise levels between DNL 65-69 dB, the only incompatible land use type is residential without NLR materials. There are a limited number of residential structures within this noise zone between Avenue L and Avenue M, east of Sierra Highway. These residential dwellings exist along with low-intensity industrial uses, generally at a density of less than 1 dwelling unit per acre. Per Air Force Compatibility Guidance, residential development of less than 1 unit per acre is classified as open/agricultural/low density. Consequently, these housing units are not represented on Figure 5.4. Although the construction standards for these dwellings are unknown, the dwellings are assumed to be incompatible based on the age of the units. Interior noise levels would be acceptable if adequate noise reductions were achieved in the construction of these structures. However, exterior noise levels could still interfere with verbal communication, relaxation, etc.

At noise levels between DNL 70-74 dB, residential, public/quasi-public, and commercial areas without NLR materials are considered to be incompatible land uses. A few commercial uses along Sierra Court and at the intersection of Avenue M and Sierra Highway are located within the 70-74 dB noise contour. These uses normally would be considered compatible in these noise zones if acceptable noise level reductions were achieved in the construction of the structures. For commercial uses, only those areas where the public is received, or where sound levels are normally low would require noise level reductions. If these reductions were achieved, this area could be compatible. These areas are considered incompatible based on the age of the structures and likelihood that NLR were not achieved.

5.7 Summary—Land Use

Historically there has been constructive cooperation between the local jurisdictions and Plant 42 in coordinating land development near the Plant. Local planning agencies have incorporated AICUZ recommendations into their planning documents and zoning ordinances. This latest update notes that of the over 4,500 acres that are either within the APZs or under the noise contours, only 109 acres are considered incompatible (Table 5.5). Of these areas, incompatibility is predominantly associated with the presumed lack of sound attenuation in these structures, rather than a conflict of prohibited land use types.

This update, which is based on November 2001 flying operations at Plant 42, reports a general decrease in the noise level contours as compared with 1990 condition (Figure 4.6). This is particularly seen in land areas east of the Plant 42 boundary, as well as areas to the west along Highway 14, and to the north of the Plant boundary. These reductions are attributed to many factors, such as changes in the type of aircraft flown and changes to aircraft flight tracks.

For the future, it is important that the local jurisdictions and the Air Force continue to work together to ensure that future development is compatible with the flying mission of Plant 42. Several issues have been identified as a result of this AICUZ update. The location of the Overflight Zone, as developed by the 1990 Joint Land Use Committee, may need to be re-evaluated now that new (smaller) noise contours have been developed. Also, local jurisdictions should continue to review their long range plans and zoning ordinances to ensure compatibility. In some instances, for example, future land use plans show agricultural uses whereas the zoning designations are for future industrial uses. And finally, future plans for increased flights associated with LAWA operations at Plant 42, whether they be for cargo or passenger increases, must also be considerate of impacts on land development patterns and on the ongoing mission of the Air Force at the Plant.

5.8 Planning Considerations

AICUZ noise contours describe the noise characteristics of a specific operational environment, and as such, will change if a significant operational change is made. An AICUZ Study should be amended if the noise exposure map changes by DNL 2 dB or more in noise sensitive areas from the noise contour map in the last publicly released AICUZ Study. With this in mind, this AICUZ Study updates the 1990 AICUZ Study and provides flight track, accident potential, zone and noise zone information in this report which reflects the most accurate picture of the installation's aircraft activities as of November 2001.

SECTION 6
IMPLEMENTATION

6.1 Introduction

Implementation of the AICUZ Study must be a joint effort between the Air Force and adjacent communities. The role of the Air Force is to minimize impact on the local communities by Plant 42 aircraft operations. The role of the communities is to ensure that development in the surrounding area is compatible with accepted planning and development principles and practices.

6.2 Air Force Responsibilities

In general, the Air Force perceives its AICUZ responsibilities as encompassing the areas of flying safety, noise abatement, and participation in the land use planning process.

Well-maintained aircraft and well-trained aircrews do a great deal to assure aircraft accidents are avoided. Despite the best aircrew training and aircraft maintenance intentions, however, history clearly shows that accidents do occur. It is imperative flights be routed over sparsely populated areas as regularly as possible to reduce the exposure of lives and property to a potential accident.

Commanders are required by Air Force Instruction to periodically review existing traffic patterns, instrument approaches, weather minima, and operating practices, and evaluate these factors in relationship to populated areas and other local situations. This requirement is a direct result and expression of Air Force policy that all AICUZ plans must include an analysis of flying and flying-related activities designed to reduce and control the effects of such operations on surrounding land areas. Noise is generated from aircraft both in the air and on the ground. In an effort to reduce the noise effects of Plant 42 operations on surrounding communities, the installation routes flight tracks to avoid populated areas.

Preparation and presentation of this Plant 42 AICUZ Study is one phase of continuing Air Force participation in the local planning process. It is recognized that as the local community updates its land use plans, the Air Force must be ready to provide additional input when needed.

It is also recognized that the AICUZ program is an ongoing activity even after compatible development plans are adopted and implemented. Installation personnel are prepared to participate in the continuing discussion of zoning and other land use matters as they may affect, or may be affected by Plant 42. Installation personnel also are available to provide information, criteria, and guidelines to state, regional, and local planning bodies, civic associations, and similar groups.

6.3 Local Community Responsibilities

Area residents and personnel of Plant 42 have a long history of working together for mutual benefit. Adoption of the following recommendations will strengthen this relationship, increase the health and safety of the public, and help protect the integrity of the installation's flying mission:

- Use overlay maps of the AICUZ noise contours and Air Force Land Use Compatibility Guidelines to evaluate existing and future land use proposals.
- Implement height and obstruction ordinances that reflect current Air Force and Federal Aviation Regulation Part 77 requirements.
- Modify building codes to ensure new construction within the AICUZ area has the recommended NLR incorporated into its design and construction.
- Continue to inform Plant 42 personnel of planning and zoning actions that have the potential of affecting Plant 42 operations.
- Continue to support working groups, such as the Joint Land Use Committee, that consist of city, county, and installation planners and that meet as needed to discuss AICUZ concerns and major development proposals that could affect airfield operations.

Data Request 143:

Please provide information about mitigation measures that could be implemented to discourage congregations of birds at the storm water retention ponds.

Response:

There are no stormwater *retention ponds* located at the PHPP. Instead, the facility has been designed to provide stormwater management via four *infiltration basins* ranging in size from 0.87 to 5.38 acres of stormwater infiltration area. To discourage birds from congregating at the infiltration basins and meet Federal Aviation Administration (FAA) objectives, each infiltration basin conforms to FAA Advisory Circular 150-5200/33B, which provides guidance for project developers on land uses that have the potential to attract hazardous wildlife (e.g., creating aircraft hazards from bird strikes) on or near public-use airports. The FAA recommends that off-airport stormwater management systems located within the 10,000-foot separation area for turbine powered aircraft be designed and operated so as not to create aboveground standing water. Specifically, stormwater infiltration ponds must be designed, engineered, constructed, and maintained for a maximum 48–hour detention period after the design storm and must remain dry in between storms. To facilitate the control of potential hazards due to wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow and linearly shaped water detention basins.

Accordingly, the PHPP infiltration basins:

1) Will maintain a maximum detention time between rainfall events of no more than 48 hours;

2) Will drain completely and remain dry in between rainfall events;

3) Will be steep-sided (33 percent slope), maintaining at least two-feet of freeboard, and lined along the bank with rip-rap; and

4) Will be narrow and linearly shaped as much as possible in accordance with site-specific constraints.

In addition, the entire site boundary will be provided with perimeter protection (i.e., chain-link fencing) to keep out terrestrial wildlife.

The PHPP Conceptual Site Plan (see Attachment DR-138 in Land Use) provides the proposed locations of the four PHPP infiltration basins.

The Applicant has performed detailed infiltration calculations and design models employing Darcy's Law, the Kozeny-Carman model, and Natural Resources Conservation Service published data, in order to confirm that site soils are capable of providing the required maximum (i.e., 48-hour) detention time for both 10-year and 100-year design storms. These calculations are provided in Attachment DR-143 at the end of this section. In addition, during the pre-construction phase, the Applicant plans to perform field percolation tests to confirm the design assumptions used in the calculations and to ensure that the design of the four infiltration basins are in compliance with FAA guidance.

It should be noted that the area surrounding the PHPP site has historically had problems with periodic flooding after major rainfall events, particularly along Sierra Highway and East Avenue M, and the PHPP infiltration basin design will maximize storm water infiltration which reduces the potential for area flooding and storm flows to the existing drainage areas. This, in turn, reduces the amount of standing water after major rainfall events throughout the PHPP vicinity.

In addition to the engineering measures proposed above, the Applicant could also incorporate bird hazing techniques to ensure birds do not congregate during the short period of time (i.e., less than 48 hours) that the infiltration basins may contain water after storm events. These techniques could include visual and/or auditory devices to frighten the birds, including air or gas cannons, human flushing, bioacoustic deterrents, flags and streamers. Techniques also could be used in combination if birds adapt to one particular technique.

Traffic and Transportation

Attachment DR-143

PHPP Infiltration Basin Permeability Calculations

INFILTRATION BASIN WATER RETENTION ESTIMATES
PALMDALE POWER PROJECT,
PALMDALE, CALIFORNIA

WATER PRODUCTION DURING 10 AND 100-YEAR STORM EVENTS

Basin ID	10-Yr Storm volume (ft3)	10-Yr Volume (acre-ft)	100-Yr Storm volume (ft3)	100-Yr Volume (acre-ft)	Infiltration Area (ft2)	Infiltration Area (acre)
Basin 3 (NW)	**217,333**	**4.99**	**884,263**	**20.30**	**234,558**	**5.38**
Basin 7.1 (NE)	**612,446**	**14.06**	**1,253,910**	**28.79**	**116,608**	**2.68**
Basin 8.1 (SW)	**483,148**	**11.09**	**1,026,366**	**23.56**	**68,690**	**1.58**
Basin 8.2 (SE)	**353,747**	**8.12**	**708,035**	**16.25**	**37,940**	**0.87**

The above information (storm water quantity and size of basins) was provided by Kleinfelder

Definitions

acre-ft/day	acre-feet per day
acre-ft/hr	acre-feet per hour
GPD	gallons per day
GPH	gallons per hour
GPM	gallons per minute
hr(s)	hour or hours
Q	flow (or water production)

ESTIMATE RETENTION BASIN INFILTRATION RATES USING A RANGE OF VERTICAL PERMEABILITIES

Assume that basin is designed for initial (temporary) downward flow and NOT for permanent horizontal ground water flow
Assume that the underlying soil has capability to discharge inflowing water into the surrounding aquifer (initial conditions are not saturated)
Assume a range in vertical permeability between silty sands
Estimate the Downward Percolation Rate using $Q=k_v\ i\ A$, Darcy's law where

Q	flow (ft^3/d)
k_v	vertical permeability (cm/s)
i	downward (vertical) hydraulic gradient (ft/ft) or 1.0 ft/ft
A	infiltration area (ft^2)

Design for Infiltration using Range of Silty Sands

INFILTRATION BASIN WATER RETENTION ESTIMATES
PALMDALE POWER PROJECT,
PALMDALE, CALIFORNIA

1) Use a model that predicts pemeability for materials based on sieve analysis

Using Kozeny-Carman Model (Journal of Geotech and Geoenvironmental Eng ASCE Nov 2003, D. Carrier) permeability (k_v) would be

$k_v = (1.99 \times 10^{4})*(100\%/\{SUM[f_i/(D^{0.404}_{li} \times D^{0.595}_{si})]\}^2 * (1/SF^2) * [n^3/(1-n)]$

Where 1.99 x 10 4 = Derived in article = (unit weight of permeant/viscosity of permeant)* (1/ Kozeny-Carman empirical coefficient)

k_v = verical permeability

SF Shape Factor or medium angularity = 7.5 (from Loudon source in Carrier article)

n = porosity = 0.3 estimate for Silty sands

Sample B-11-1 ,(sieve Size (D) (cm)	$D^{0.404}$	$D^{0.595}$	$D^{0.404}_{li} \times D^{0.595}_{si}$	% retained between sieves (f_i)	$=f_i / D_{ave\ i}$
0.95	0.979			0%	
0.475	0.740	0.64	0.63	0%	0
0.2	0.522	0.38	0.28	4%	0.1
0.085	0.369	0.23	0.12	8%	0.7
0.0425	0.279	0.15	0.06	17%	3.0
0.015	0.183	0.08	0.02	39%	17.0
0.0075	0.139	0.05	0.01	19%	19.1
0	0.000	0.00	0.00	13%	
			SUM	100%	39.9 $=SUM(f_i / D_{ave\ i})$

$D_{eff} = 100\ \% / [Sum\ (f_i/D_{ave\ i})]$ 0.025

D_{eff}^2 or $(100\%/\{SUM[f_i/(D^{0.404}_{li} \times D^{0.595}_{si})]^2$ 0.00063

$(1/SF^2)$ = 0.018

$[n^3/(1+n)]$ = 0.021

k_v = 0.0046 cm/sec or kv = 13.10 ft/day

Infiltration Q (ft3/day) = kv * i * A							
Basin 3 (NW)	5.38	acre	infiltration flow Q =	3,073,297	ft^3/day		
Basin 7.1 (NE)	2.68	acre	infiltration flow Q =	1,527,857	ft^3/day		
Basin 8.1 (SW)	1.58	acre	infiltration flow Q =	900,011	ft^3/day		
Basin 8.2 (SE)	0.87	acre	infiltration flow Q =	497,109	ft^3/day		
Determine the time to infiltrate the 10 year storm event							
Basin 3 (NW)			0.07	days or	1.7	hours	
Basin 7.1 (NE)			0.40	days or	9.6	hours	
Basin 8.1 (SW)			0.54	days or	12.9	hours	
Basin 8.2 (SE)			0.71	days or	17.1	hours	
Determine the time to infiltrate the 100 year storm event							
Basin 3 (NW)			0.3	days or	6.9	hours	
Basin 7.1 (NE)			0.8	days or	19.7	hours	
Basin 8.1 (SW)			1.1	days or	27.4	hours	
Basin 8.2 (SE)			1.4	days or	34.2	hours	

INFILTRATION BASIN WATER RETENTION ESTIMATES
PALMDALE POWER PROJECT,
PALMDALE, CALIFORNIA

2) Use published data for surficial soils to predict permeability, Use USDA NCRS web Soil Survey 2.1 information

From NRCS web site , running Soil Survey 2.1 for the entire Palmdale site, south of M St, between 10th and 15th in Palmdale, CA

~40% of the area is Adelanto Sandy Loam with a		28	micrometers per sec Hydraulic conduct (Ksat)
~60 % is Cajon Sandy Loam with a		92	micrometers per sec Hydraulic conduct (Ksat)
Determine the weighted average for the site or		66.4	micrometers per sec Hydraulic conduct (Ksat)
or	Ksat = kv =	18.82	ft/day

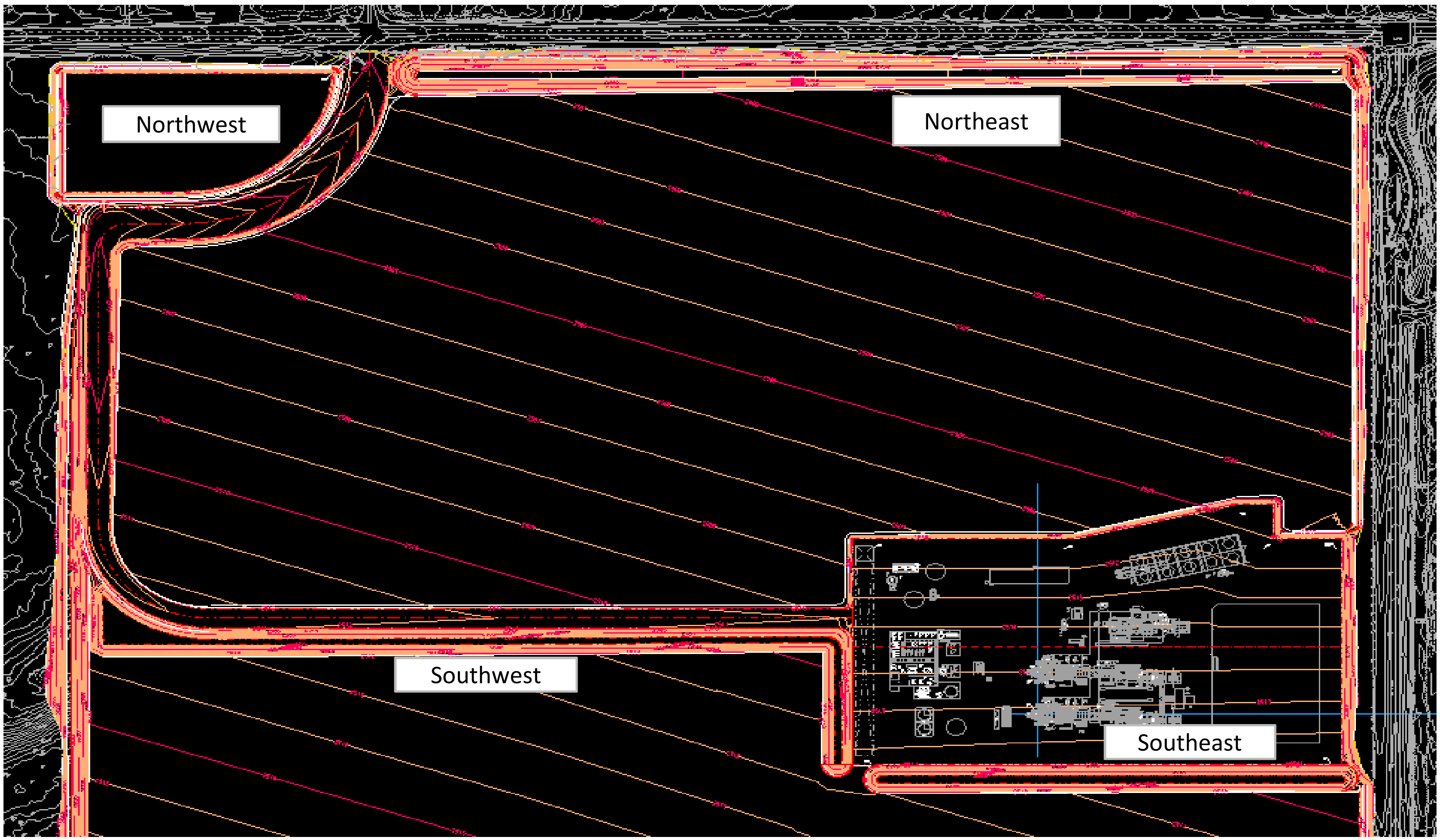
Infiltration Q (ft3/day) = kv * i * A							
Basin 3 (NW)	5.38	acre	infiltration flow Q =	4,414,862	ft^3/day		
Basin 7.1 (NE)	2.68	acre	infiltration flow Q =	2,194,801	ft^3/day		
Basin 8.1 (SW)	1.58	acre	infiltration flow Q =	1,292,886	ft^3/day		
Basin 8.2 (SE)	0.87	acre	infiltration flow Q =	714,108	ft^3/day		
Determine the time to infiltrate the 10 year storm event							
Basin 3 (NW)			0.05	days or	1.2	hours	
Basin 7.1 (NE)			0.28	days or	6.7	hours	
Basin 8.1 (SW)			0.37	days or	9.0	hours	
Basin 8.2 (SE)			0.50	days or	11.9	hours	
Determine the time to infiltrate the 100 year storm event							
Basin 3 (NW)			0.2	days or	4.8	hours	
Basin 7.1 (NE)			0.6	days or	13.7	hours	
Basin 8.1 (SW)			0.8	days or	19.1	hours	
Basin 8.2 (SE)			1.0	days or	23.8	hours	

Infiltration & Evaporation Calculation

KPE Project 2007-021: Palmdale

Given: Palmdale Site with four infiltation/evaporation ponds
Find: Time required to empty each pond after 10 year storm and 100 year storm using evaporation & infiltration
Solution:

Site w/pond labels:



Infiltration Summary:

Design Basis: Assume land cover is 40% Adelanto Sandy Loam, and 60% is Cajon Sandy Loam

Rainfall Data:

Return Period (yrs)	**2**	**5**	**10**	**25**	**50**	**100**
SCS 24-hr Precip (in)	1.39	1.93	2.34	2.88	3.31	3.75

Adelanto SL (40%) =	28	microns/s
Cajon SL (60%)=	92	microns/s
Weighted Average =	66.4	microns/s

10 year event

	Volume (ft^3)	Infil. Area (ft^2)	Time to empty (hrs)
NW	217333	234558	1.2
NE	612446	116608	6.7
SW	483148	68690	8.9
SE	353747	37940	11.9

100 year event

	Volume (ft^3)	Infil. Area (ft^2)	Time to empty (hrs)
NW	884263	234558	4.8
NE	1253910	116608	13.7
SW	1026366	68690	19.0
SE	708035	37940	23.7

Rainfall Data from NOAA Atlas 14

http://hdsc.nws.noaa.gov/hdsc/pfds/index.html

Infiltration Data from WSS (Web Soil Survey, USDA Natural Resources Conservation Service)

http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

Evaporation Data from WRCC (Western Regional Climate Center) - Using "Mojave" station, closest to Palmdale

http://www.wrcc.dri.edu/htmlfiles/westevap.final.html#CALIFORNIA

Data Request 138:

Please provide information on the new gas metering station location. Specifically, although the station is proposed to be located outside of the PHPP fenced area, would it be located within the PHPP parcel?

Response:

Yes, the gas metering station will be located outside of the power plant boundaries but within the boundaries of the PHPP parcel. The metering station was relocated because of a request from SoCal Gas to maintain consistency with their business practices and to allow for routine maintenance without interfering with PHPP operations. In addition, the City of Palmdale would gain better access (if needed) to the adjacent property, and there would be less traffic (vehicles and people) on the PHPP site, resulting in greater plant security.

Please see the PHPP Final Parcel Map and Conceptual Layout provided in Attachment DR-138 at the end of this section.

Data Request 139:

In addition, address whether the general plan land use and zoning designations for the metering station would be the same as the PHPP site.

Response:

Yes, the general plan land use and zoning designations for the metering station are the same as those of the PHPP site since the metering station is located within the boundary of the PHPP parcel. The General Plan Amendment (GPA) 09-01 and Zone Change (ZC) 09-01 proposals for the PHPP site were approved at the Palmdale City Council meeting held on April 1, 2009. The GPA 09-01 amended the General Plan Land Use designation from Palmdale Business Park Specific Plan (SP-10) to Industrial (IND); and the ZC 09-01 amended the Zoning designation from SP-10 to M-2 (General Industrial). The second reading was held on April 15, 2009 and the final map is expected to become final on May 15, 2009.

Data Request 140:

Please provide information regarding the type of land uses and development timeline, if any, the city anticipates for the 300 acres to the west of the PHPP.

Response:

As indicated in Data Request 139, the adjacent 300-acre parcel has been re-designated as M-2. The City does not have any current or reasonably foreseeable plans for a specific development on the 300-acre parcel west of the PHPP site.

Data Request 141:

Please address whether the gas metering station for the PHPP would be shared by the land uses that are anticipated for development on the 300 acres adjacent to the PHPP.

Response:

The City has no current or foreseeable plans to develop the adjacent parcel. It is the City's intention to locate the gas metering station and its off take capability so that it is available for supplying natural gas to future users of the adjacent site.

Data Request 142:

Please update the applicable AFC Land Use figures (e.g., jurisdictional boundaries, Important Farmlands, general plan land use designations, zoning designations, etc.) showing the revised linear route alignments. This information is needed for staff to accurately describe the land use setting through which these lines traverse.

Response:

The applicable Land Use figures include the following:

Figure 5.5-1	Land Use Study Area
Figure 5.7-2a	City of Palmdale General Plan land Use
Figure 5.7-2b	City of Lancaster General Plan land Use
Figure 5.7-2c	County of Los Angeles General Plan Land Use
Figure 5.7-3a	City of Palmdale Zoning
Figure 5.7-3b	City of Lancaster Zoning
Figure 5.7-3c	County of Los Angeles General Plan Zoning
Figure 5.7-4	Air Installation Compatible Land Use Zone
Figure 5.7-5	Important Farmland in the Vicinity of the Project and Linear Facilities

All of the above figures have been updated to include the revised sanitary wastewater linear route alignment. Copies of the revised Land Use figures are provided as part of Attachment DR-142 included at the end of this section.

Land Use

Attachment DR-138

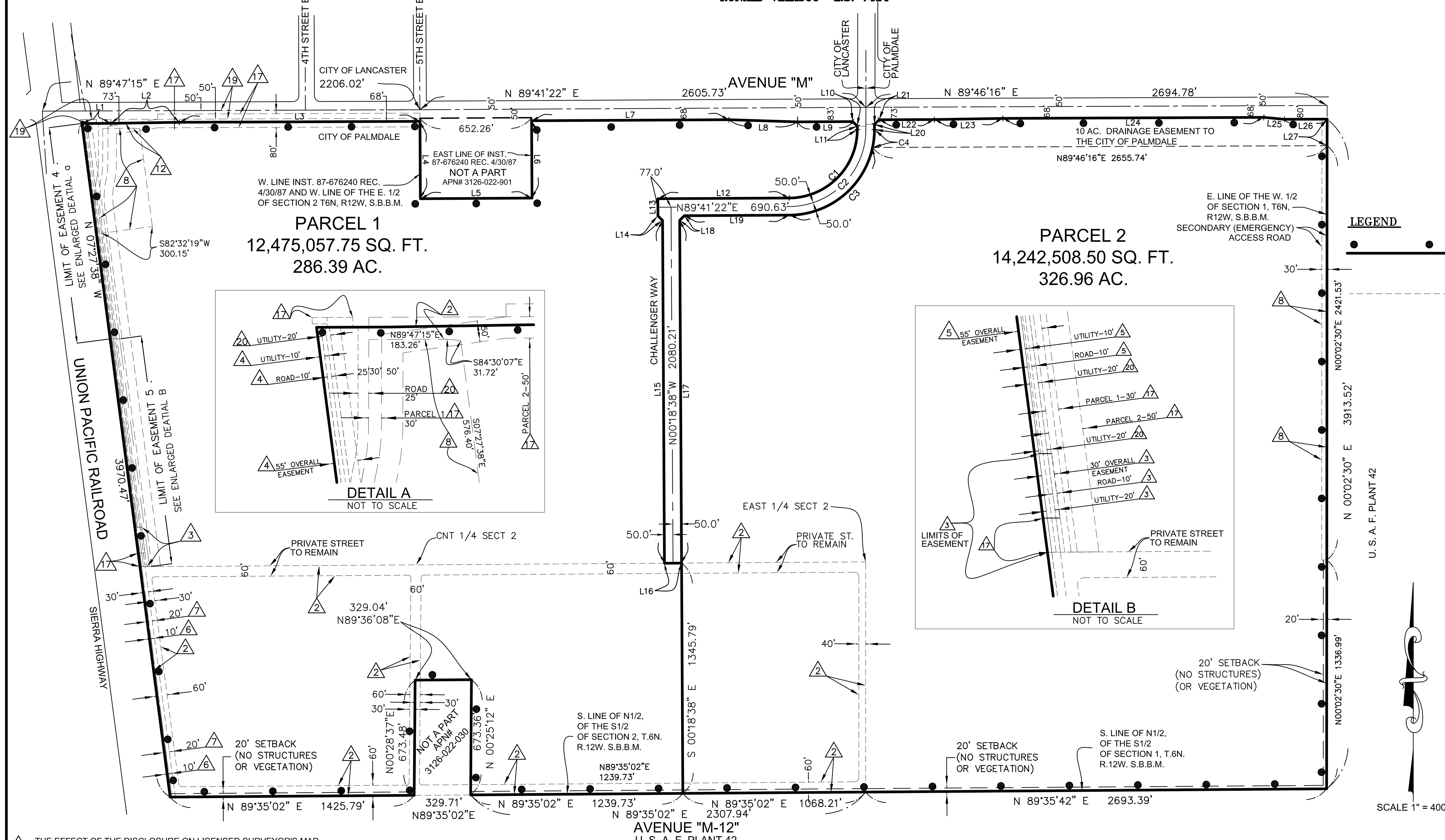
PHPP Final Parcel Map and Conceptual Site Layout

NUMBER OF PARCELS 2
ACREAGE 613.35 AC

PARCEL MAP NO.070999

BEING A MERGER AND RE-SUBDIVISION OF PARCELS 1-20, INCLUSIVE, OF PARCEL MAP NO. 24191, IN THE CITY OF PALMDALE , COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 283 PAGES 31-39 OF PARCEL MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY

RONALD VELASCO L.S. 7424



LEGEND

INDICATES THE BOUNDARY OF THE LAND BEING SUB-DIVIDED BY THIS MAP

INDICATES AN EXISTING EASEMENT AS NOTED

2. THE EFFECT OF THE DISCLOSURE ON LICENSED SURVEYOR'S MAP FILED IN BOOK 66 PAGE 40 OF RECORDS OF SURVEY, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY. OF CERTAIN STRIPS OVER A PORTION OF SAID LAND, DESIGNATED PRIVATE STREETS.

3. AN EASEMENT OF AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION FOR ROAD AND INCIDENTAL PURPOSES PER DOCUMENT RECORDED DECEMBER 2, 1964 AS INSTRUMENT NO. 4830 IN BOOK D2719 PAGE 163, OF OFFICIAL RECORDS.

4. AN EASEMENT OF SOUTHERN CALIFORNIA TELEPHONE COMPANY FOR POLES AND APPURTENANCES AND INCIDENTAL PURPOSES PER DOCUMENT RECORDED AS BOOK 20018 PAGE 254, OF OFFICIAL RECORDS.

5. AN EASEMENT OF SOUTHERN CALIFORNIA TELEPHONE COMPANY FOR POLES AND CONDUITS AND INCIDENTAL PURPOSES PER DOCUMENT RECORDED SEPTEMBER 28, 1943 AS DOCUMENT NO. 12543-L OF TORRENS.

6. AN EASEMENT OF PACIFIC TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION FOR POLES AND CONDUITS AND INCIDENTAL PURPOSES PER DOCUMENT RECORDED MAY 8, 1952 AS INSTRUMENT NO. 2993 IN BOOK 38891 PAGE 191, OF OFFICIAL RECORDS. PARTIALLY QUITCLAIM BY A DOCUMENT RECORDED ON JUNE 9, 1995 AS INSTRUMENT NO. 95-923582, OF OFFICIAL RECORDS.

7. AN EASEMENT OF AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION FOR UNDERGROUND CABLES, WIRES AND CONDUITS AND INCIDENTAL PURPOSES PER DOCUMENT RECORDED MAY 15, 1964 AS INSTRUMENT NO. 6017, OF OFFICIAL RECORDS.

8. AN EASEMENT OF THE CITY OF PALMDALE FOR FLOOD CONTROL AND INGRESS AND EGRESS PURPOSES AS DEDICATED ON PARCEL MAP NO. 24191 P.M.B. 283-31-39, RECORDS OF LOS ANGELES COUNTY. PORTION OF SAID EASEMENT IS ABANDONED PER THIS MAP.

9. AN EASEMENT OF THE CITY OF PALMDALE FOR INGRESS AND EGRESS AND PUBLIC UTILITY PURPOSES AS DEDICATED ON PARCEL MAP NO. 24191 P.M.B. 283-31-39, RECORDS OF LOS ANGELES COUNTY. T.B.A.

10. EASEMENT FOR DRAINAGE PURPOSES IN FAVOR OF PARCELS 1 THROUGH 18 PER PARCEL MAP NO. 24191 P.M.B. 283-31-39, RECORDS OF LOS ANGELES COUNTY. (TO BE RESERVED IN DOCUMENTS PER SAID MAP). T.B.A.

11. EASEMENT FOR FUTURE STREET PURPOSES PER PARCEL MAP NO. 24191 P.M.B. 283-31-39, RECORDS OF LOS ANGELES COUNTY. (WHEN THE FUTURE STREET WITHIN PARCEL 18 OF SAID MAP IS ACCEPTED AS A PUBLIC STREET, PARCEL 18 WILL INCLUDE PROPERTY ON BOTH SIDES OF SAID STREET WHICH MUST BE CONVEYED AS ONE UNIT AND CANNOT BE SEPARATED WITHOUT FURTHER ACTION OF THE ADVISORY COMMITTEE. T.B.A.

12. 32 FOOT WIDE LANDSCAPE SETBACK PER THE PALMDALE BUSINESS PARK CENTER SPECIFIC PLAN AS SHOWN ON PARCEL MAP NO. 24191 P.M.B. 283-31-39, RECORDS OF LOS ANGELES COUNTY.

17. EASEMENT OF ANTELOPE VALLEY EAST-KERN WATER AGENCY FOR WATER PIPELINES, RIGHT OF WAY AND APPURTENANCES PER DOCUMENT RECORDED MARCH 22, 1988 AS INSTRUMENT NO. 88-386752, OF OFFICIAL RECORDS.

19. AN EASEMENT OF THE CITY OF PALMDALE FOR PUBLIC ROAD AND HIGHWAY AND INCIDENTAL PURPOSES PER DOCUMENT RECORDED MARCH 11, 1969 AS INSTRUMENT NO. 2898, OF OFFICIAL RECORDS.

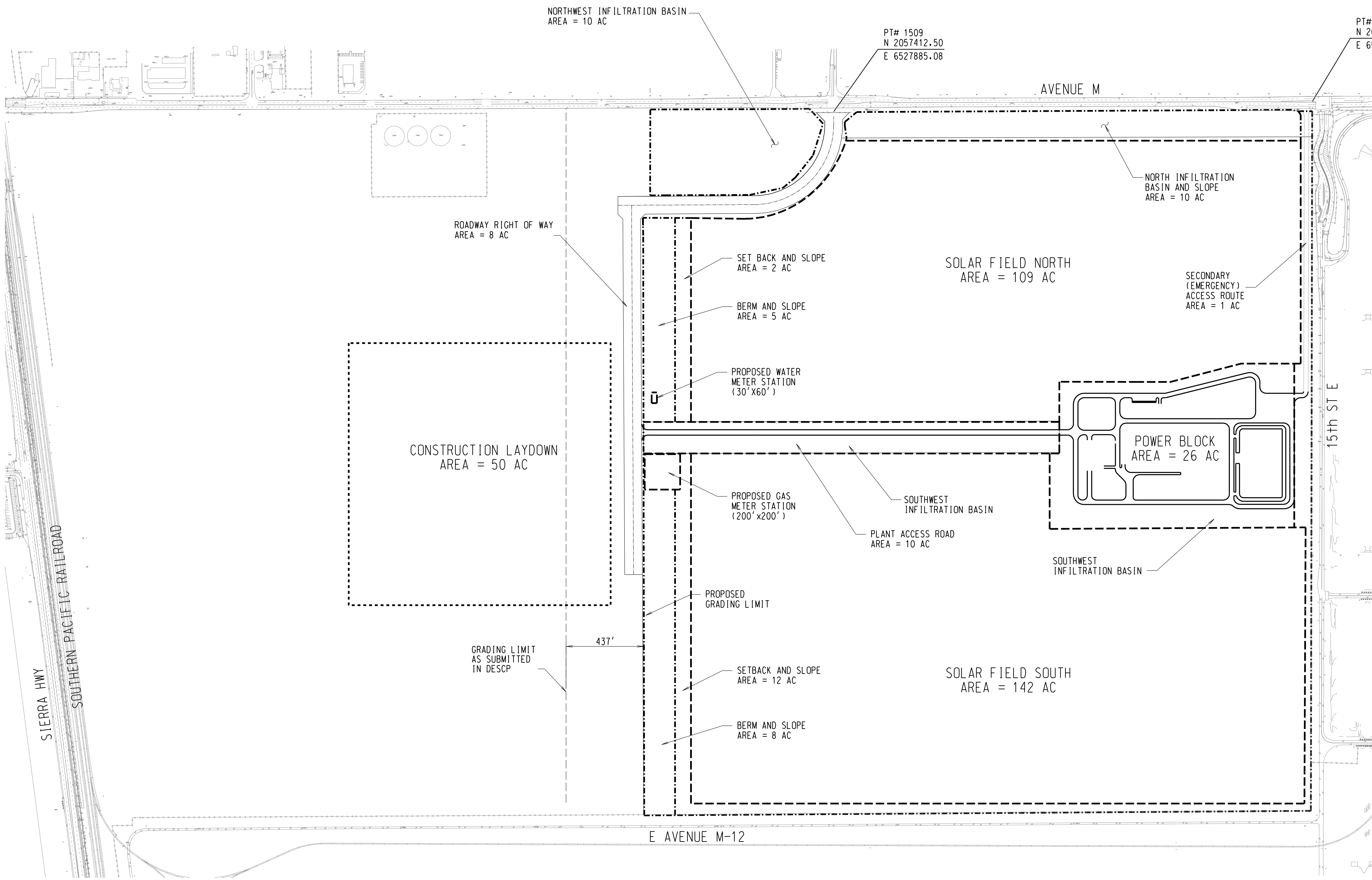
20. AN EASEMENT OF AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION FOR POLES AND CONDUITS AND INCIDENTAL PURPOSES PER DOCUMENT RECORDED JULY 2, 1965 AS INSTRUMENT NO. 4431 IN BOOK D2964 PAGE 743, OF OFFICIAL RECORDS.

LINE TABLE

LINE	LENGTH	BEARING
L1	168.92	N89°47'15"E
L2	400.03	N89°04'17"E
L3	1406.14	N89°47'15"E
L4	452.00	S00°18'38"E
L5	652.26	N89°41'22"E
L6	452.00	N00°18'38"W
L7	1153.47	N89°41'22"E
L8	400.28	S88°09'47"E
L9	322.52	N89°41'22"E
L10	38.07	S45°08'45"E
L11	19.99	S00°01'07"W
L12	767.63	S89°41'22"W
L13	100.00	S00°18'38"E
L14	38.18	S45°18'38"E
L15	2003.33	S00°18'38"E
L16	100.00	N89°37'14"E
L17	2003.21	S00°18'38"E
L18	38.18	S44°41'22"W
L19	613.63	N89°41'22"E
L20	30.50	S00°01'07"W
L21	38.27	S44°53'42"W
L22	323.31	S89°46'16"W
L23	400.03	S89°03'18"W
L24	1524.78	S89°46'16"W
L25	120.60	N84°31'06"W
L26	249.62	S89°46'16"W
L27	155.00'	N00°02'30"E

CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA
C1	626.02'	400.00'	89°40'15"
C2	704.27'	450.00'	89°40'15"
C3	677.20'	500.00'	77°36'04"
C4	105.33'	500.00'	12°04'11"



NOTES:

1. STACK COORDINATES-

HRSG 1:
STATE PLANE GROUND COORDINATE
N: 2055300.000
E: 6529671.000

GEOGRAPHIC COORDINATE (NAD 83)
LATITUDE: 35 38 23.91803
LONGITUDE: 118 06 22.94693

BASE ELEVATION: 2517

HRSG 2:
STATE PLANE GROUND COORDINATE
N: 2055435.000
E: 6529671.000

GEOGRAPHIC COORDINATE (NAD 83)
LATITUDE: 34 38 25.25346
LONGITUDE: 118 06 22.94864

BASE ELEVATION: 2517

- PRELIMINARY -
NOT FOR CONSTRUCTION

REV	DESCRIPTION	DWN	CHK	APP	DATE
A	ISSUE FOR REVIEW	MTW			04-15-09

CITY OF PALMDALE

PALMDALE HYBRID
POWER PROJECT

Kiewit

Kiewit Power
8455 Lenexa Drive
Lenexa, Kansas 66214

CONCEPTUAL SITE LAYOUT

	by	date
DESIGNED	MDM	01-06-09
DRAWN	MDM	01-06-09
CHECKED		
APPROVED		

DRAWING NUMBER
2007-021-CM-500

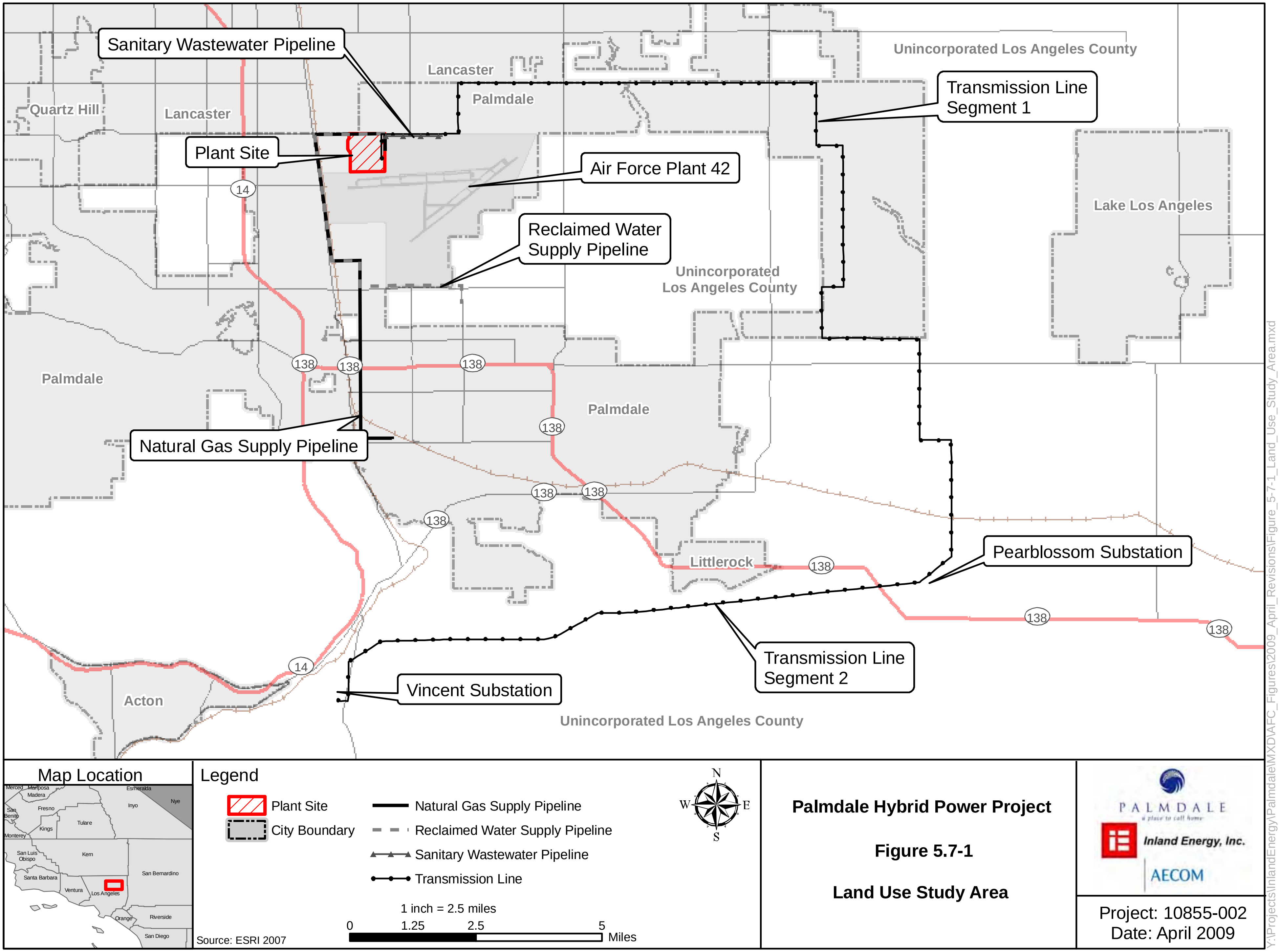
N

300 0 300 600
SCALE IN FEET
SCALE: 1" = 300'

Land Use

Attachment DR-142

Revised AFC Land Use Figures

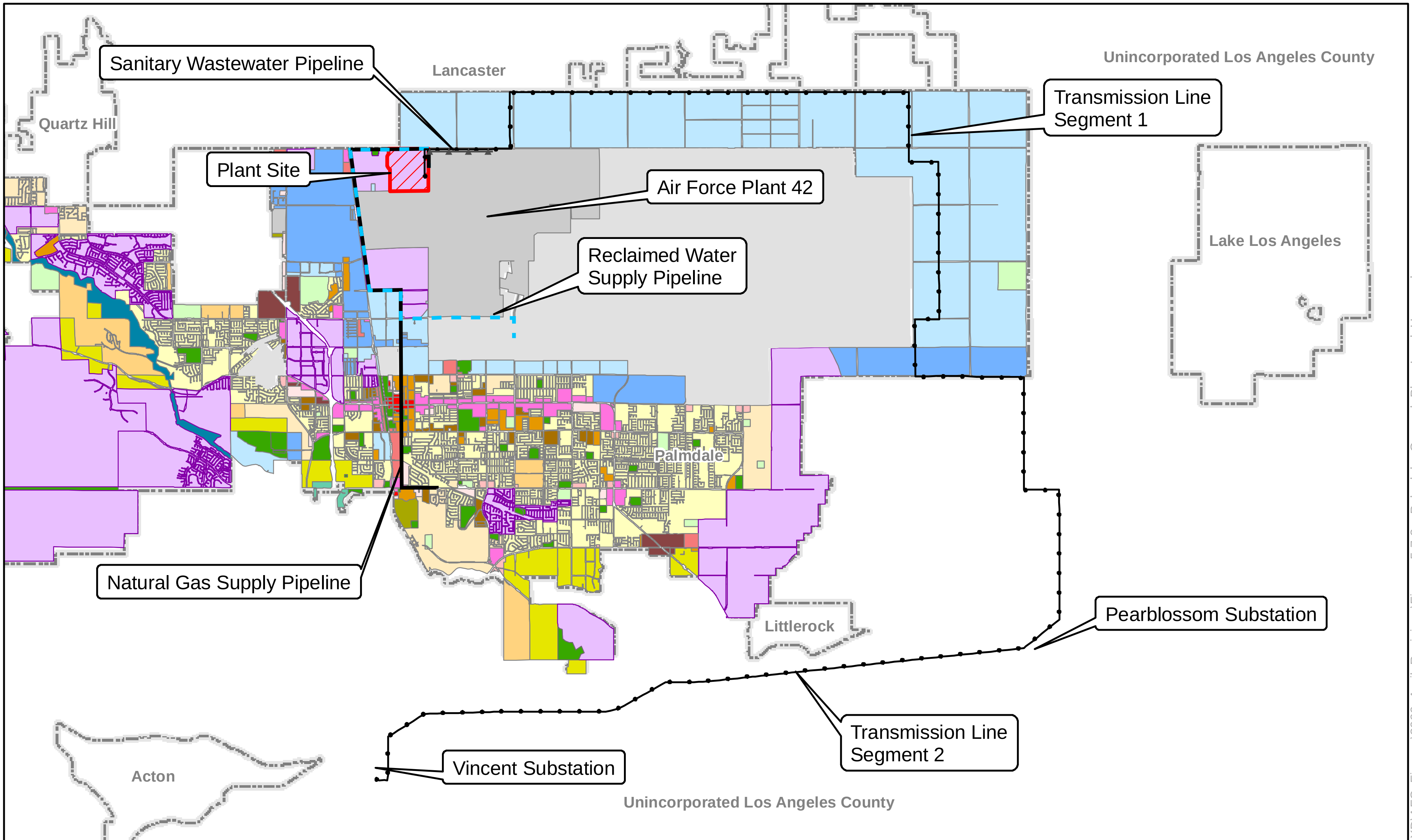


Palmdale Hybrid Power Project

Figure 5.7-1

Land Use Study Area

Project: 10855-002
Date: April 2009



Map Location

Legend

- Plant Site
- City Boundary
- Natural Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- Sanitary Wastewater Pipeline
- Transmission Line

N W E S

1 inch = 2.5 mile

0 1.25 2.5 5 Miles

Source: City of Palmdale 2008

Palmdale Hybrid Power Project

Figure 5.7-2a

City of Palmdale
General Plan Land Use

PALMDALE a place to call home

Inland Energy, Inc.

AECOM

Project: 10855-002
Date: April 2009

Y:\Projects\InlandEnergy\Palmdale\MXD\AFC_Figures\2009_April_Revisions\Figure_5-7-2a_Palmdale_General_Plan_Land_Use.mxd

Legend

Parcel

City of Palmdale

Commercial

- Neighborhood Commercial (NC)
- Office Commercial (OC)
- Community Commercial (CC)
- Downtown Commercial (DC)
- Commercial Manufacturing (CM)
- Regional Commercial (RC)

Other Land Use

- Public Facility (PF)
- Open Space (OS)
- Mineral Resource Extraction (MRE)
- Specific Plan (SP)
- California Aqueduct
- Other Jurisdiction

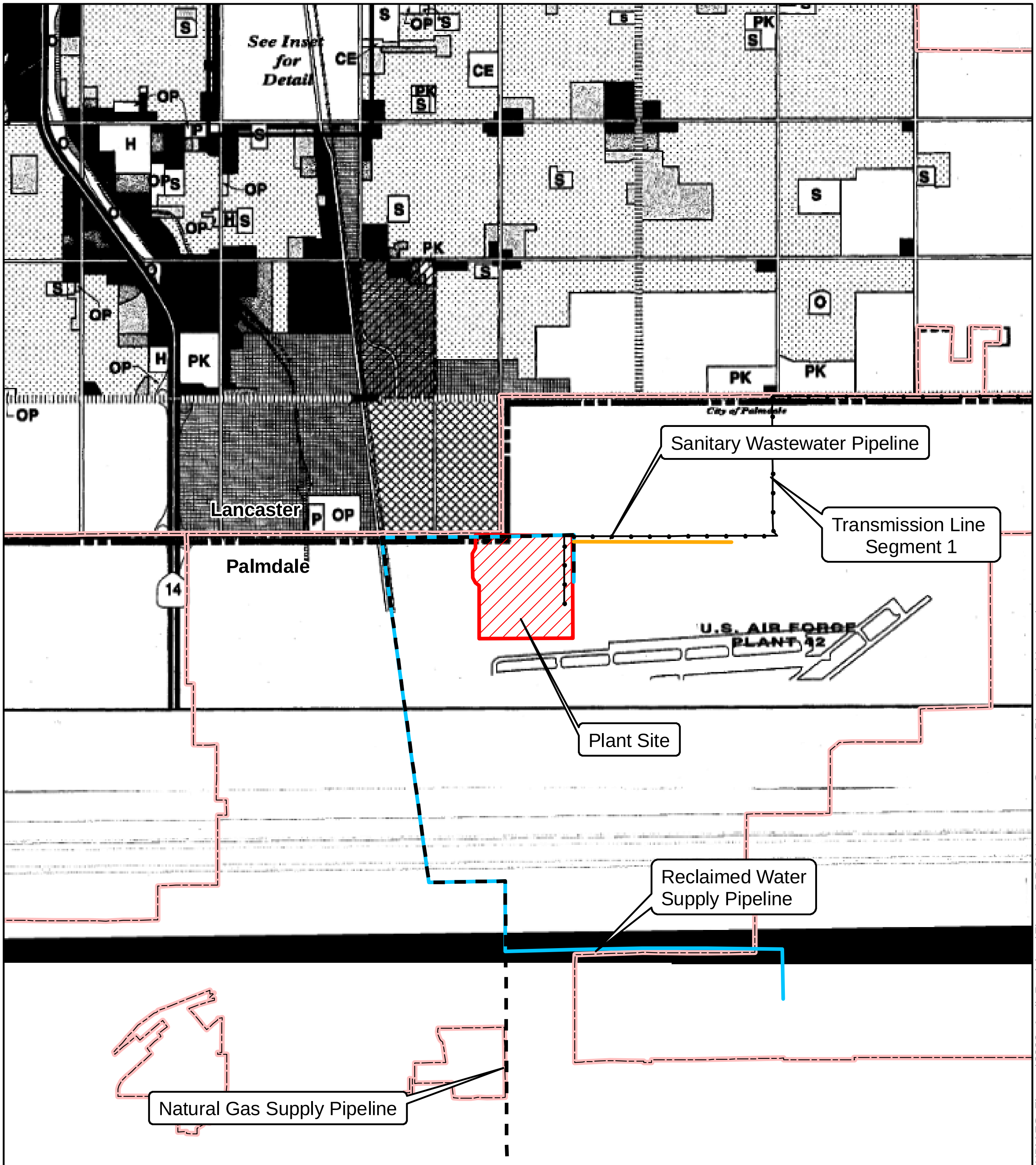
LACO: Unincorporated LA County Pocket

Residential

- Equestrian Residential (ER)
- Low Density Residential (LDR)
- Single Family Residential (SFR-1)
- Single Family Residential (SFR-2)
- Single Family Residential (SFR-3)
- Medium Residential (MR)
- Multifamily Residential (MFR)
- Special Development (SD)

Industrial

- Industrial (IND)
- Business Park (BP)
- Airport and Related Uses (AR)



Map Location

Legend

- Plant Site
- Transmission Line
- Sanitary Wastewater Pipeline
- Natural Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- City Boundary

N W E S

Source: City of Lancaster 2008

Palmdale Hybrid Power Project

Figure 5.7-2b

City of Lancaster
General Plan Land Use

1 inch = 1 mile

0 0.5 1 2 Miles

PALMDALE
a place to call home
Inland Energy, Inc.
AECOM

Project: 10855-002
Date: April 2009

Y:\Projects\InlandEnergy\Palmdale\MXD\AFC_Figures\2009_April_Revisions\Figure_5-7-2b_Lancaster_General_Plan_Land_Use.mxd

LEGEND

Non Urban Residential

NU (0.4-2.0 DU/AC)

Urban Residential

UR (2.1-6.5 DU/AC)

Multi–Residential

MR1 (6.6-15.0 DU/AC)

MR2 (15.1-30 DU/AC)

Commercial

Commercial

OP Office/Professional

Employment

Light Industry

Heavy Industry

Specific Plan

Specific Plan

Facilities

P Public Use

S Public School

PK Park

H Health Care

CE Cemetary

O Open Space

Sphere of Influence

City Boundary

Proposed Regional Arterial

Paved Roads

Unpaved Roads

Edwards Air Force Base

Union Pacific Rail Road

Land Use Boundary

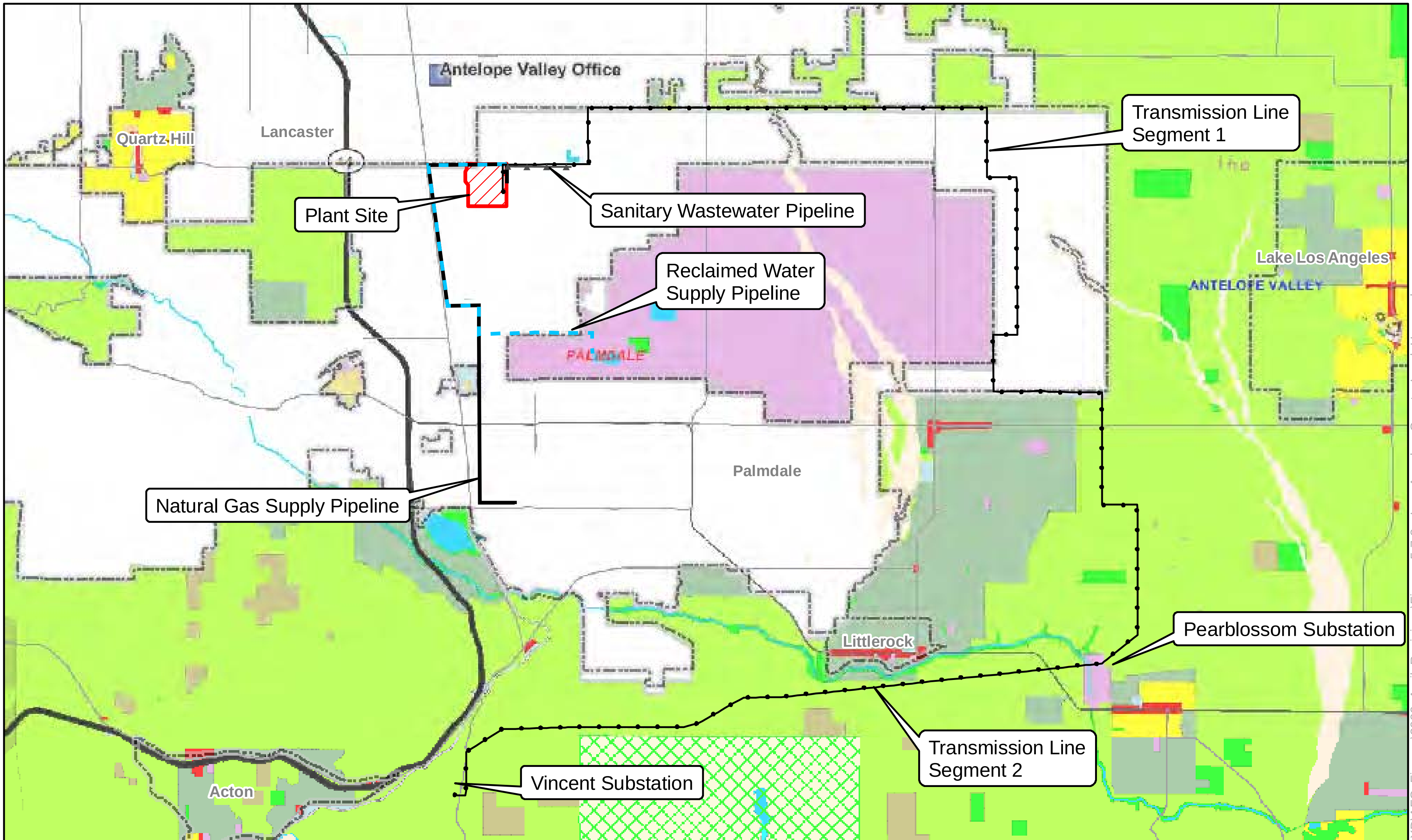
Transit Village Boundary

Prime Desert Woodland

High Desert Transportation Corridor Study Area

LANCASTER GENERAL PLAN

Adopted October 28, 1997 by Resolution 97-102



Map Location

Legend

- Plant Site
- City Boundary
- Natural Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- Sanitary Wastewater Pipeline
- Transmission Line

N E S W

1 inch = 2.5 mile

0 1.25 2.5 5 Miles

Source: County of Los Angeles 2008

Palmdale Hybrid Power Project

Figure 5.7-2c

County of Los Angeles General Plan Land Use

PALMDALE a place to call home

Inland Energy, Inc.

AECOM

Project: 10855-002
Date: April 2009

Y:\Projects\InlandEnergy\Palmdale\MXD\AFC_Figures\2009_April_Revisions\Figure_5-7-2c_Los_Angeles_County_Land_Use.mxd

Los Angeles County Land Use

Legend

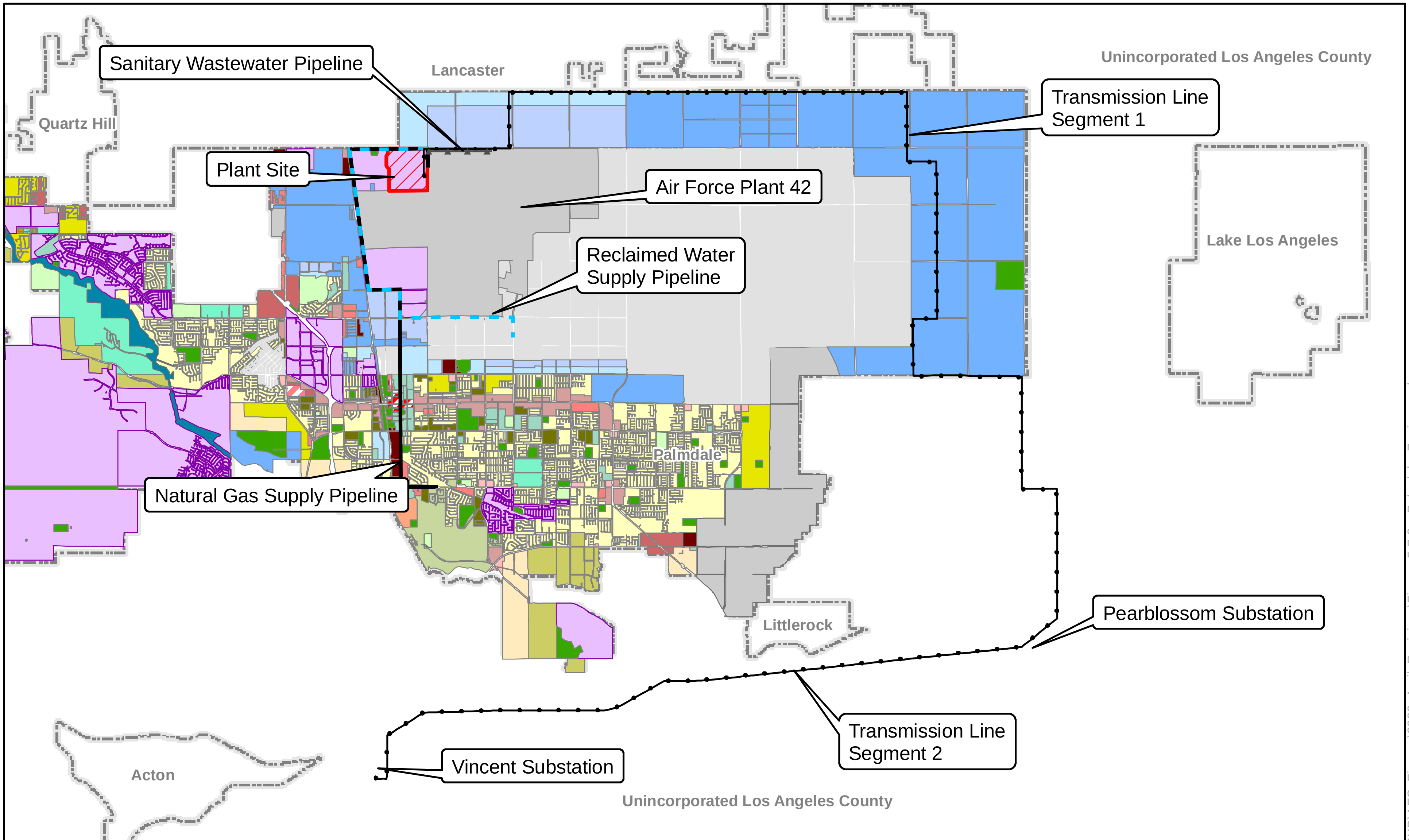
Landuse

Type

- 1 - Low Density Residential (1 to 6 du/ac)
- 2 - Low/Medium Density Residential (6 to 12 du/ac)
- 3 - Medium Density Residential (12 to 22 du/ac)
- 4 - High Density Residential (22 or more du/ac)
- C - Major Commercial
- I - Major Industrial
- O - Open Space
- P - Public and Semi-Public

Facilities

- RC - Rural Communities
- R - Non-Urban
- TC - Transportation Corridor



Map Location

Legend

Plant Site
City Boundary
Natural Gas Supply Pipeline
Reclaimed Water Supply Pipeline
Sanitary Wastewater Pipeline
Transmission Line

1 inch = 2.5 mile

0 1.25 2.5 5 Miles

Source: City of Palmdale 2008

Palmdale Hybrid Power Project

Figure 5.7-3a

City of Palmdale Zoning

PALMDALE a place to call home

Inland Energy, Inc.

AECOM

Project: 10855-002
Date: April 2009

Y:\Projects\InlandEnergy\Palmdale\MXD\AFC_Figures\2009_April_Revisions\Figure_5.7-3a_Palmdale_Zoning.mxd

Legend

- Parcel
- City of Palmdale

Commercial

- Light Commercial (C-1)
- Office Commercial (C-2)
- Mixed Transition (C-2 MX)
- General Commercial (C-3)
- Commercial Center (C-4)
- Service Commercial (C-5)
- Downtown Commercial (CD)
- Mixed Transition (CD-MX)

Other Zoning

- Open Space and Recreation (OR, OS)
- Public Facility (PF)
- Quarry and Reclamation (QR)
- Specific Plan (SP)
- California Aqueduct
- Other Jurisdiction

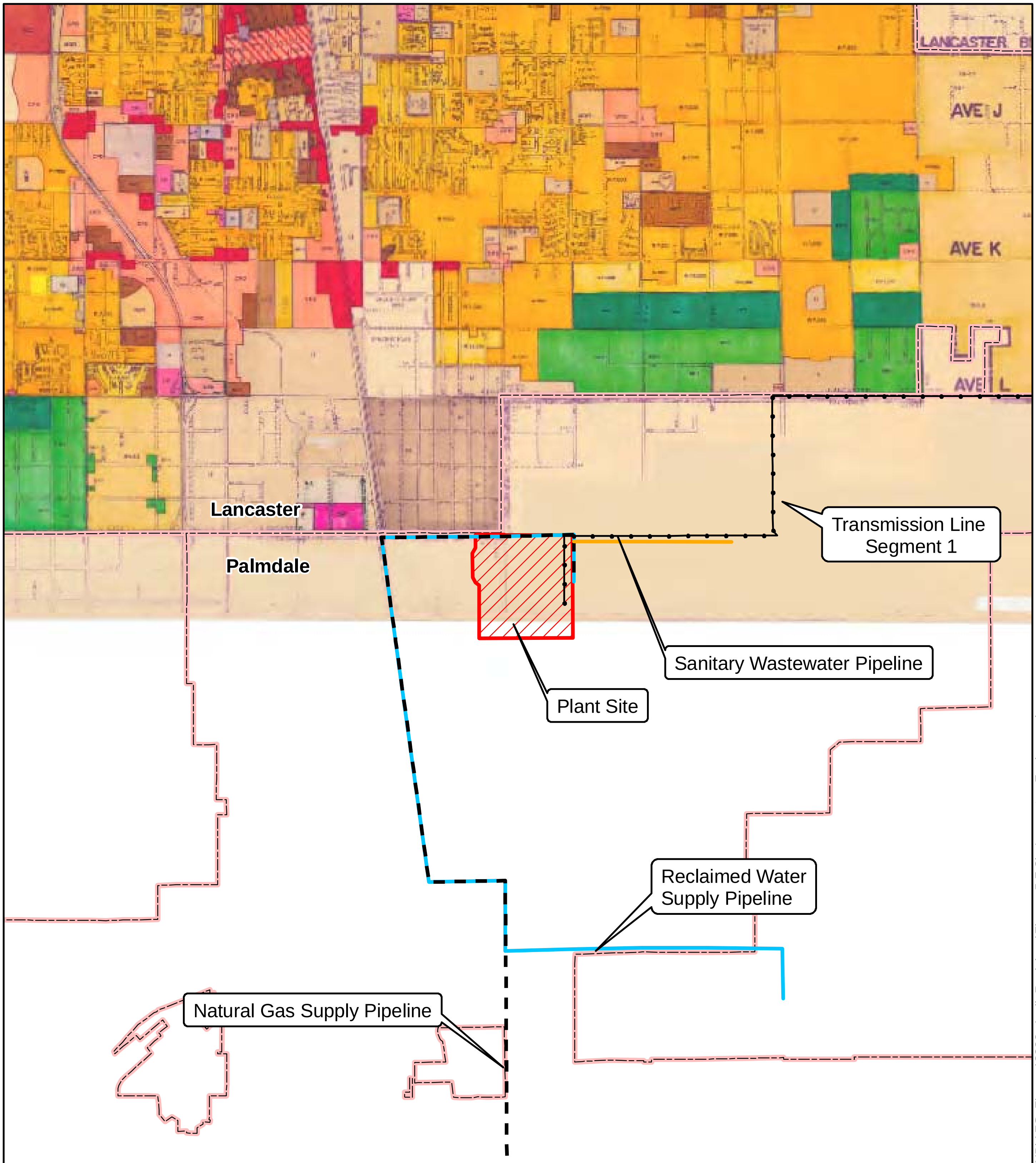
LACO: Unincorporated LA County Pocket

Industrial

- Light Industrial (M-1)
- General Industrial (M-2)
- Airport Industrial (M-3)
- Planned Industrial (M-4)

Residential

- Single Family Residential (R-1-1)
- Single Family Residential (R-1-2.5)
- Single Family Residential (R-1-7,000)
- Single Family Residential (R-1-10,000)
- Single Family Residential (R-1-12,000)
- Single Family Residential (R-1-13,000)
- Single Family Residential (R-1-15,000)
- Single Family Residential (R-1-20,000)
- Medium Residential (R-2)
- Multiple Residential (R-3)
- Light Agriculture (A-1)



Map Location

Legend

- Plant Site
- Transmission Line
- Sanitary Wastewater Pipeline
- Natural Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- City Boundary

N W E S

Source: City of Lancaster 2008

Palmdale Hybrid Power Project

Figure 5.7-3b

City of Lancaster Zoning

1 inch = 1 mile

0 0.5 1 2 Miles

PALMDALE
a place to call home

Inland Energy, Inc.

AECOM

Project: 10855-002
Date: April 2009

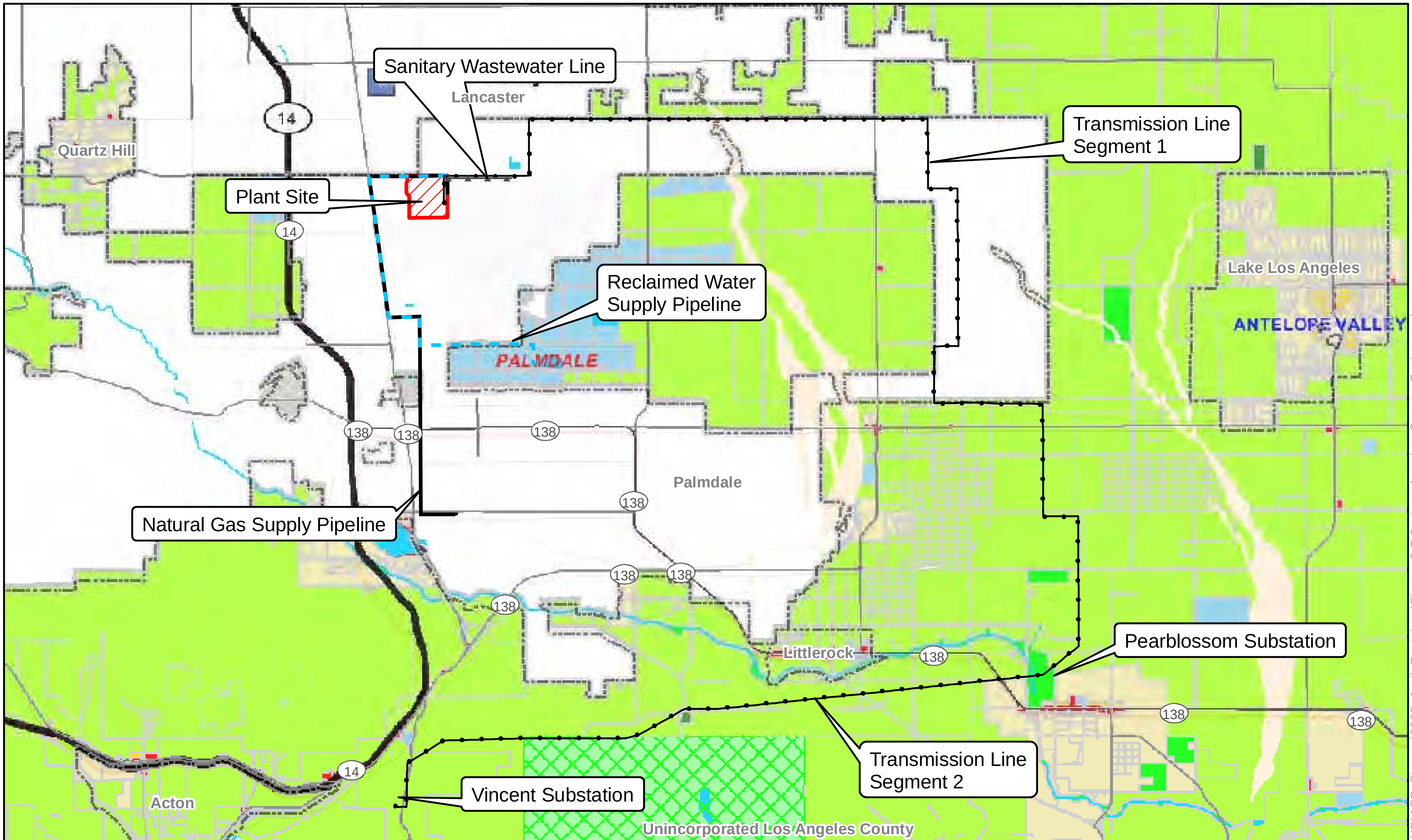
Y:\Projects\InlandEnergy\Palmdale\MXD\AFC_Figures\2009_April_Revisions\Figure_5-7-3b_Lancaster_Zoning.mxd

City of Lancaster Zoning

Legend

Zoning

RR-2.5	Rural Residential of 1 Unit/2.5 Acres
RR-1	Rural Residential of 1 Unit/1 Acre
SRR	Semi-Rural Residential of 1-2 Units/Acre
R-15,000	Single Family Residential on 15,000 Sq. Ft. Lots
R-10,000	Single Family Residential on 10,000 Sq. Ft. Lots
R-8,500	Single Family Residential on 8,500 Sq. Ft. Lots
R-7,000	Single Family Residential on 7,000 Sq. Ft. Lots
MHP	Mobile Home Park
MDR	Medium Density Residential of 7.1-15 Units/Acre
HDR	High Density Residential of 15.1-30 Units/Acre
	Subject to General Plan Policy
C	Commercial
CPD	Commercial Planned Developement
CBD	Central Buisness District
RC	Regional Commercial
OP	Office Professional
LI	Light Indusrty
HI	Heavy Industry
H	Hospital
P	Public
O	Open Space
SP	Specific Plan



Map Location

Legend

- Plant Site
- City Boundary
- Natural Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- Sanitary Wastewater Pipeline
- Transmission Line

N W E S

1 inch = 2.5 mile

0 1.25 2.5 5 Miles

Source: County of Los Angeles 2008

Palmdale Hybrid Power Project

Figure 5.7-3c

County of Los Angeles General Plan Zoning

PALMDALE
a place to call home
Inland Energy, Inc.
AECOM

Project: 10855-002
Date: April 2009

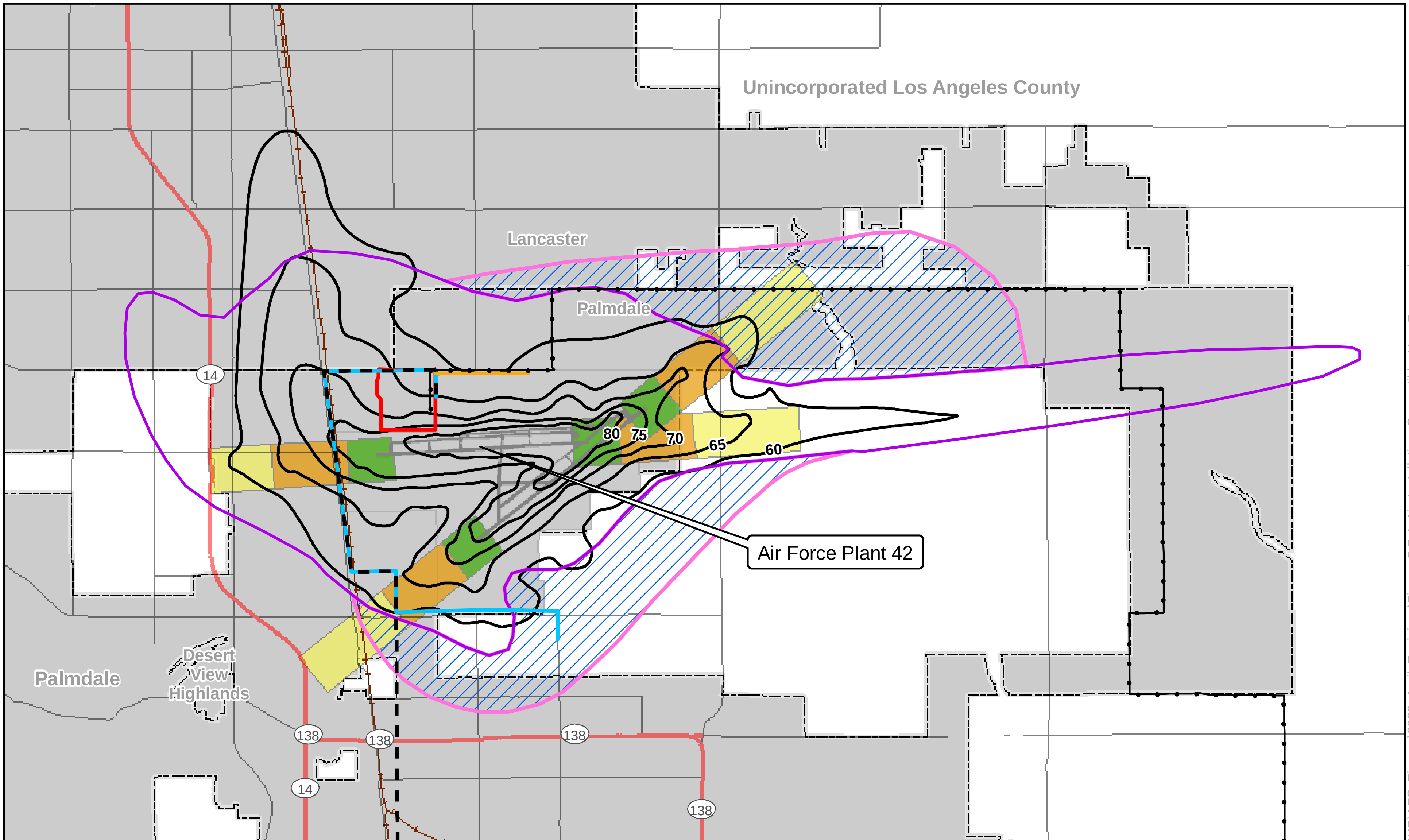
Y:\Projects\InlandEnergy\Palmdale\MXD\AFC_Figures\Revisions\2009_April_Revisions\Figure_5.7-3c_Los_Angeles_County_Zoning.mxd

Los Angeles County Zoning

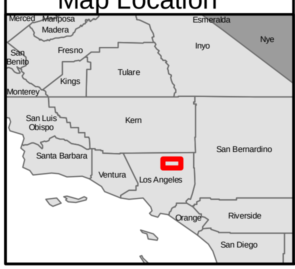
Legend

Zoning

Zone A-1
Zone A-2
Zone B-1
Zone B-2
Zone C-1
Zone C-2
Zone C-3
Zone C-H
Zone C-M
Zone CPD
Zone C-R
Zone D-2
Zone IT
Zone M-1
Zone M-1.5
Zone M-2
Zone M-3
Zone MPD
Zone MXD
Zone O-S
Zone P-R
Zone R-1
Zone R-2
Zone R-3-( )U
Zone R-4-( )U
Zone R-A
Zone RPD
Zone R-R
Zone SP
Zone SRD
Zone W



Map Location



Legend

- Plant Site
- Overflight Zone
- City Boundary
- Transmission Line
- Sanitary Wastewater Pipeline
- Natural Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- Accident Potential Zone 1
- Accident Potential Zone 2
- Clear Zone
- Noise Contour
- 1990 DNL 65 dB Noise Contour

1 inch = 1.75 mile

0 0.875 1.75 3.5 Miles

N W E S

Source: AICUZ Study 2002

Palmdale Hybrid Power Project

Figure 5.7-4

Air Installation Compatible Use Zone

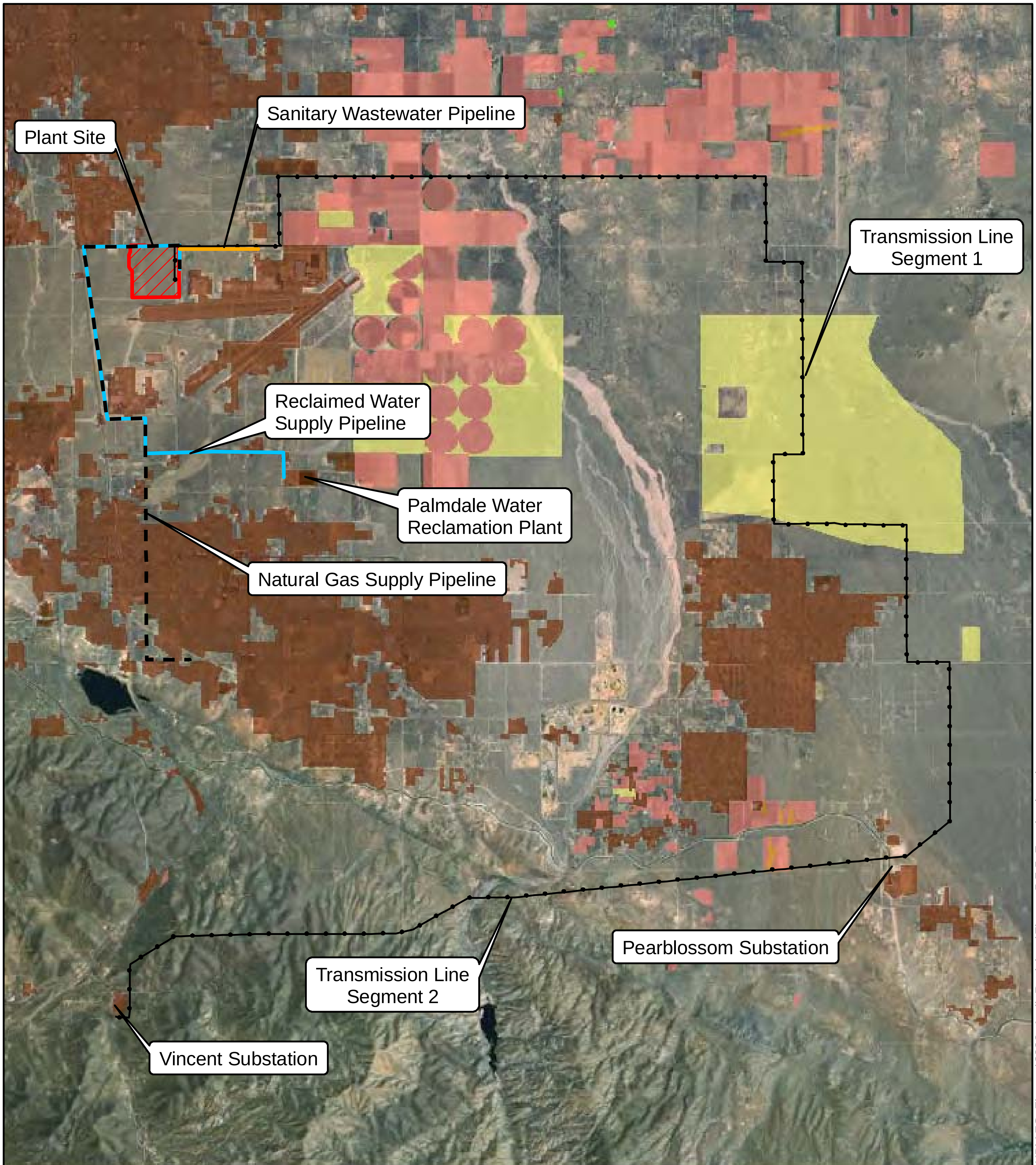
PALMDALE
a place to call home

Inland Energy, Inc.

AECOM

Project: 10855-002
Date: April 2009

Y:\Projects\InlandEnergy\Palmdale\MXD\AFC_Figures\2009_April_Revisions\Figure_5-7-4_Air_Installation_Compatible_Use_Zone.mxd



Map Location

Legend

- Plant Site
- Sanitary Wastewater Pipeline
- Transmission Line
- Natural Gas Supply Pipeline
- Reclaimed Water Supply Pipeline
- Urban Land
- Grazing Land
- Prime Farmland
- Statewide Important Farmland
- Unique Farmland

N W E S

Palmdale Hybrid Power Project

Figure 5.7-5

Important Farmland in the Vicinity of the Project and Linear Facilities

1 inch = 2 miles

0 1 2 4 Miles

PALMDALE a place to call home

Inland Energy, Inc.

AECOM

Project: 10855-002
Date: April 2009

Y:\Projects\InlandEnergy\Palmdale\MXD\AFC_Figures\2009_April_Revisions\Figure_5-7-5_Farmland.mxd

Data Request 137:

Prepare Geoarchaeological Study of PHPP area per CEC clarification and agreement with Applicant per Energy Commission Data Request 22, revised by the Applicant on 1/29/09 and further revised by CEC Staff on 1/30/09. In response to Data Request 22, the Applicant proposes to provide additional information on which to assess the potential presence and locations of buried archaeological sites in the proposed project area for the purpose of gauging whether the construction and operation of the proposed project could impact such resources.

Response:

The PHPP Geoarchaeological Study that responds to amended Data Request 22 is included as Attachment DR-137. The Figure 3, Soils Map, and Figure 4, Archaeological Sensitivity Map, are provided in a separate map folder.

PALMDALE HYBRID POWER PROJECT
CITY OF PALMDALE
SAN BERNARDINO COUNTY, CALIFORNIA

Response to Palmdale Hybrid Power Project (08-AFC-09), San Bernardino County, California.
CEC Staff Set 2 Data Request Number 137.
Technical Area: Cultural Resources.

Prepared for:
AECOM on Behalf of Inland Energy

Prepared by:

William Self Associates, Inc.
Orinda, CA

April 2009

ATTACHMENT DR-137

PALMDALE HYBRID POWER PROJECT

GEOARCHAEOLOGICAL STUDY

The California Energy Commission (CEC) Staff requested (Data Request 22) that the Applicant prepare and submit a two-phased assessment of the potential presence and locations of buried archaeological sites in the proposed PHPP area to gauge whether the construction of the PHPP had the potential to impact such resources. Phase 1 of the assessment was to be a regional assessment of the geomorphology and geoarchaeology of the portion of the Antelope Valley that includes, but was not limited to, the Project area. Phase 2 was to be a site-specific geomorphological and geoarchaeological analysis of the Project area. On behalf of the Applicant, William Self Associates, Inc. (WSA) has undertaken this assessment, which combines both phases of the study.

Data for the assessment were derived from a review of the available literature for archaeology, geoarchaeology, and Quaternary science to address “what is currently known about the incidence of buried archaeological deposits” in the study area. Because the archaeological data acquired for this assessment were somewhat limited for the project area, the regional and site-specific assessments were collapsed into a single, regional study that encompasses the project area and surrounding environs, as there was no apparent useful distinction in the results of separate scalar analyses. Portions of the Angeles National Forest in Kern County, portions of the Antelope Valley in Los Angeles County, the southeastern portion of Edwards Air Force Base, and parts of Kern and Los Angeles Counties comprise the study area, as depicted on Figure 1.

Methodology

In order to obtain the archaeological and geomorphological information about the study area, four records search areas were selected (Figure 1). Area 1, the northernmost, was selected because of the likelihood that buried sites are present; this area had been excavated for the Caltrans Highway 14 bridges and road-widening work, and it encompasses archaeological sites exposed by a range fire that had been buried by windblown sands (personal communication between Dave DeVries with archaeologist Rick Norwood, April 14, 2009). Area 2 was selected because toe slopes of the alluvial fan and sand dunes within it are thought to cover what at one time would have been a marshy, game-rich area near the receding Rosamond Lake shore, with high potential for buried archaeological sites. Area 3 was selected because the development of the region west of Lancaster and Highway 14 was thought to have potentially generated a significant number of cultural resource surveys and data recovery efforts as part of intensive residential development. Area 4 was selected because of its centrality in the Project area and because it covers some high potential soils near canyon mouths and on the terraces of Little Rock Creek. The four search areas are shown in Figure 1.

As the line separating Los Angeles County from Kern County bisects record search Area 1, a records search was conducted at two regional information centers: the South Central Coastal Information Center, California State University, Fullerton (SCCIC) for Los Angeles County and at the Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield for Kern County.

Requests were made at each of the information centers for a list of all cultural resource studies conducted within each search area and a map depicting the areal coverage of each study. Lists of the recorded archaeological sites within the search areas were not requested, since the site numbers themselves would not provide any information about the nature of any prehistoric sites (i.e., buried or surficial), and it was cost-prohibitive to request copies of each site record in order to make that determination. The studies would also potentially provide more geomorphological contextual information than the site records, which are compiled from data used to prepare the studies.

The staff at the SCCIC conducted the records search of the four areas on March 12, 2009 (SCCIC #9337.6280). The records search produced a bibliographic list of 122 cultural resource studies that have been conducted in the records search areas within Los Angeles County. Another 13 studies had been conducted within the record search areas, but specific provenience for those studies was lacking. The SCCIC only knew that they had been conducted within the general region. The bibliographic information provided for the 122 studies was examined to identify reports that potentially contained information on subsurface archaeological sites. Six studies were selected from the list provided by the SCCIC for their potential to yield information about subsurface prehistoric archaeological sites. Copies of these studies were obtained from the SCCIC and the studies were utilized to help construct a geoarchaeological model of buried archaeological sites within the PHPP vicinity. The six studies are listed below.

Table 1. Cultural Resource Studies Utilized from the SCCIC

Report #	Date	Author	Title
LA-00606	1979	Robinson, R.W.	Cultural Resources Investigation submitted to Leo A. Daly, Co.
LA-00955	1981	Cottrell, Marie G.	Archaeological Test Level Investigations Conducted at CA-LAN-1060, Calabasas Area of Los Angeles County, California.
LA-01967	1989	Wade, Sue A. and Susan M. Hector	Archaeological Testing and National Register Evaluation of Site LAN-1316, Edwards Air Force Base (AFB) California.
LA-02827	1993	Robinson, R.W.	Phase II Testing of Cultural Resources Associated with Archaeological Site: 90-1 (temporary designation), Located in Section 27, T.8N, R.12W, Los Angeles County, California.
LA-07476	2004	Whitley, David S.	Phase II Archaeological Test Excavation at CA-LAN-1588h, Palmdale, Los Angeles County, California.
LA-08155	2007	Giambastiani, Mark, Sinead Ni Ghabhlain, Micah Hale, Andrea Catacora, Dave Iversen, and Mark Becker	Final Phase II Cultural Resource Evaluations of 21 Sites Along the West and Northwestern Boundaries, Edwards AFB, Kern and Los Angeles Counties, California.

On March 12, 2009, the staff at the SSJVIC at California State University, Bakersfield conducted the records search of the northern portion of Area 1 that is situated within Kern County (RS# 09-086). The records search produced a bibliographic list of 60 cultural resource studies that have been conducted within that portion of Kern County. The bibliographic information provided for the 60 studies was examined to identify reports that potentially contained information about subsurface archaeological sites. Five studies were selected from the list for their potential to yield information on subsurface prehistoric archaeological sites. Copies of these studies were obtained from the SSJVIC and the information garnered from these studies was combined with that obtained from the studies provided by the SCCIC to enhance the construction of the geoarchaeological model of buried archaeological sites within the PHPP vicinity. The five studies are listed below.

Table 2. Cultural Resource Studies Utilized from the SSJVIC

Report #	Date	Author	Title
KE-01871	1990	Everson, G. Dicken and Mark Q. Sutton	Archaeological Investigations at Four Sites in Rosamond, Kern County, California.
KE-01878	1990	Osborne, Richard H. and Mark Q. Sutton	Archaeological Evaluation (Collection and Testing) at Four Sites in Rosamond, Kern County, California.
KE-01879	1991	Osborne, Richard H. and Mark Q. Sutton	Archaeological Data Recovery at Two Sites in Rosamond, Kern County, California.
KE-01545	1991	Osborn, Richard H. and Mark Q. Sutton	Archaeological Data Recovery at Two Sites in Rosamond, Kern County, California.
KE-03537	2007	Schiffman, Robert A. and Alan P. Gold	Cultural Resource Survey for a 20-Acre Parcel Near the Intersection of Patterson Road and 20th Street West in the City of Rosamond, Eastern Kern County, California.

In addition to utilizing data gathered from the records searches, WSA also contacted Mr. Jim Johannesmeyer, co-curator of the archaeological collection in the Environmental Management Office at Edwards AFB in an attempt to obtain archaeological reports pertaining to the potential for buried sites within the PHPP study area. Although Mr. Johannesmeyer was aware of several reports and sites that potentially fell into the search criteria, he has been was unable to locate these reports.

Four reports in the WSA library containing information about buried prehistoric archaeological sites within the surrounding PHPP study area were also utilized to inform the geoarchaeological model. These reports are listed in Table 3.

Table 3. Reports Utilized from WSA library

Date	Author	Title	Publisher
2006	Smallwood, Josh	Cultural Resources Technical Report, City of Lancaster General Plan Update. Prepared by Starla Hack, RBF Consulting, Irvine, California. For Submittal to the City of Lancaster Community Development Department.	CRM TECH, Riverside, CA
1994	Byrd, Brian F., Drew Pallette, and Carol Serr	Prehistoric Settlement Along the Eastern Margin of Rogers Dry Lake, Western Mojave Desert, California.	Brian F. Mooney Associates, San Diego, California
1993	Sutton, Mark Q.	Occasional Papers in Anthropology, No. 3: Archaeological Studies in Rosamond, Western Mojave Desert, California	Museum of Anthropology, California State University, Bakersfield
1991	Sutton, Mark Q., with contributions by Paul D. Bouey, John D. Goodman II, Margaret M. Lyneis, Karen K. Swope and Robert M. Yohe II	Occasional Papers in Anthropology, No. 1: Archaeological Investigations at Cantil, Fremont Valley, Western Mojave Desert, California	Museum of Anthropology, California State University, Bakersfield

The 11 cultural resource studies obtained through the records searches and the four reports accessed through WSA's library contained specific stratigraphic information on 25 prehistoric and multi-component archaeological sites with buried deposits within the PHPP study area. These sites were all located north of the City of Lancaster, surrounding the area of Rosamond and Rogers Dry Lake. Data on the nature of the deposits and their context were compiled into tabular form used in the preparation of the geoarchaeological model of buried archaeological sites within the PHPP study area.

Geotechnical boring reports often provide data useful in identifying sequences of soil formations that, together with dating programs, can help identify the potential for human occupation. Geotechnical boring reports and bore logs can also assist in determining whether recent alluvial deposition has buried much earlier land formations. With this information, it could be possible to more accurately isolate strata on which human occupation may have occurred.

On March 23, 2009, WSA consulted with the Caltrans Geotechnical Services Office, located in Sacramento, California, in order to obtain a representative sample of geotechnical reports and bore logs from Caltrans studies within the PHPP study area. Ten reports were selected from the area along Highway 14 from Acton, California to slightly north of Lancaster, California. Data from these reports were used in the geomorphological and geoarchaeological analysis to determine the potential for buried archaeological deposits within the PHPP study area, as well as to help define areas of archaeological sensitivity.

In compiling all the record search results, including a geologic map for the PHPP study area (Figure 2), WSA determined that information pertaining to the potential for buried archaeological sites within the central portion of the study area was noticeably lacking. The majority of the reports obtained from the SCCIC for this area dealt only with the results of surficial archaeological surveys, rather than testing or excavation studies of sites that would have provided pertinent stratigraphic information. To address this shortfall, WSA compiled a list of 25 prehistoric sites that, based on their description, may have the potential for buried cultural deposits. The list was compiled from a records search table of 152 prehistoric sites presented in Smallwood (2006) (see Table 3 above.) The record search for this report had encompassed an area of 267.5-square miles in and around the City of Lancaster, Los Angeles County California. The area measures 23 miles east to west and 13 miles north to south, and is situated between the City of Palmdale on the south, and Kern County and Edwards AFB on the north. Although WSA was unable to determine if excavation reports related to these site records have been prepared, the potential that some portion of the 25 sites have buried prehistoric deposits is considered moderate, based on WSA's geomorphological/geoarchaeological consultant's analysis presented below (Dave DeVries, Mesa Technical, Inc.).

Additional information on the geomorphology, geoarchaeology, and archaeological sensitivity of the study area was gathered through personal correspondence.

At the suggestion of Ms. Laurie Lile, Assistant City Manager of the City of Palmdale, WSA's Project Director, Dr. Allen Estes, contacted Ms. Beth Padon, archaeologist from Discovery Works, Inc. on February 25, 2009. Ms. Padon provided WSA with information pertaining to projects that she had conducted in 1989 and 1996 on Ritter Ranch/ Elizabeth Lake Road on a terrace above Amargosa Creek (located approximately 5 miles west of the proposed PHPP). The archaeological sites associated with these projects are located in the foothills along the San Andreas Fault, which she considers an area of high sensitivity for buried archaeological sites, because the sites she has identified have been buried by landslides caused by land movements along the fault. Generally, the archaeological sites in the area are buried by 5 to 8 feet of colluvial deposits. Padon did not think that the potential for finding buried sites in the area of the PHPP plant site was very high, because it is not in foothills (where a diverse ecology was more suitable for habitation) and because it is not near old water sources. Prehistoric sites in the area are related to hydrology, much more so than those in coastal areas, because of the valley's aridity. There is evidence for occupation 5,000 years ago, but little information about the prehistoric population size is known.

On March 11, 2009, WSA attempted to contact by email Dr. Mark Q. Sutton, formerly of California State University Bakersfield, Department of Anthropology. Dr. Sutton has considerable experience conducting archaeological research in the desert regions encompassing the PHPP study area. The email expressed WSA's interest in obtaining information on buried archaeological sites within the Antelope Valley and Western Mojave Desert, as well as any information on previous geoarchaeological or geomorphological studies conducted within the vicinity with which he might be familiar. No response to the email was received. However, in the period of March 13 to 15, 2009, during the recent Society for California Archaeology meeting, Dave DeVries consulted with Dr. Sutton and archaeologists Rick Norwood, Beth Padon, and Bob Yohe, all of whom have knowledge of archaeology in the western Antelope Valley. Norwood and Padon have direct experience with buried sites in the region. Through these conversations, additional insights into the archeological potential of the PHPP study area were obtained and were factored into the geoarchaeological and geomorphological analysis.

Analysis and Conclusions

Using data from the 1922 and 1970 soil survey maps (Woodruff et al., 1970; Carpenter and Cosby, 1926) and current soil survey data provided by the Natural Resources Conservation Service (NRCS), WSA prepared a soils map depicting the different soils present in the PHPP study area (Figure 3-see map pocket).

WSA provided that map and the acquired data discussed above to Mesa Technical, Inc. Using those data and the information acquired through the consultation described above, Mesa Technical, Inc. conducted a geomorphological and geoarchaeological analysis of the PHPP study area and prepared a narrative soil description that assesses each soil type for archaeological sensitivity.

Based on Mesa Technical's analysis, WSA has prepared an archaeological sensitivity map that illustrates archaeological sensitivity for potential buried prehistoric sites, based on a five-level scale of High, Moderate-to-High, Moderate, Moderate-to-Low, and Low (Figure 4-see map pocket). High sensitivity areas are those that in prehistory would have been in close proximity to natural resources, such as water, game and plants, and that offered stable living surfaces (e.g., dry ground) for human populations and that today have been impacted by low-energy depositional processes; High-to-Moderate sensitivity are those areas that possess high-sensitivity characteristics but are in shallow soil contexts, such as areas subject to deflation from high wind erosion; Moderate sensitivity are those areas that were once in close proximity to water (e.g., along drainages), but were in less advantageous living areas outside of canyons and marsh areas; Moderate-to-Low sensitivity areas are those that possess moderate sensitivity characteristics but are in shallow soil contexts, such as those subject to deflation from high wind erosion; Low sensitivity areas are those that were distant from natural resources and that offered unstable living surfaces (e.g., surfaces that were under water during times of prehistoric settlement) or in areas that today are impacted by high-energy depositional processes. An examination of the project footprint overlaid on this sensitivity map indicates that the Project plant site is in an area of mostly Low or Moderate-to-Low sensitivity. The project linears are situated in areas of Moderate-to-High sensitivity (a total of 18.72 miles), while portions of the project's northernmost segment (the east-west transmission line) pass through approximately 3.87 miles designated as High sensitivity for buried prehistoric deposits (Figure 5).

References

Carpenter, E.J. and Stanley W. Cosby
1926 Soil Survey of the Lancaster Area, California. Washington:GPO.

NRCS
2009 NRCS current, Official Series Descriptions, http://soils.usda.gov/technical/classification/osd/index.html

NRCS
2009 NRCS current, Soil Survey of the Antelope Valley Area. digital spatial data. http://websoilsurvey.nrcs.usda.gov/app/

Woodruff, George A., William J. McCoy, and Wayne B. Sheldon
1970 Spoils Survey, Antelope Valley area, California. Washington: Soil Conservation Service.

FIGURES

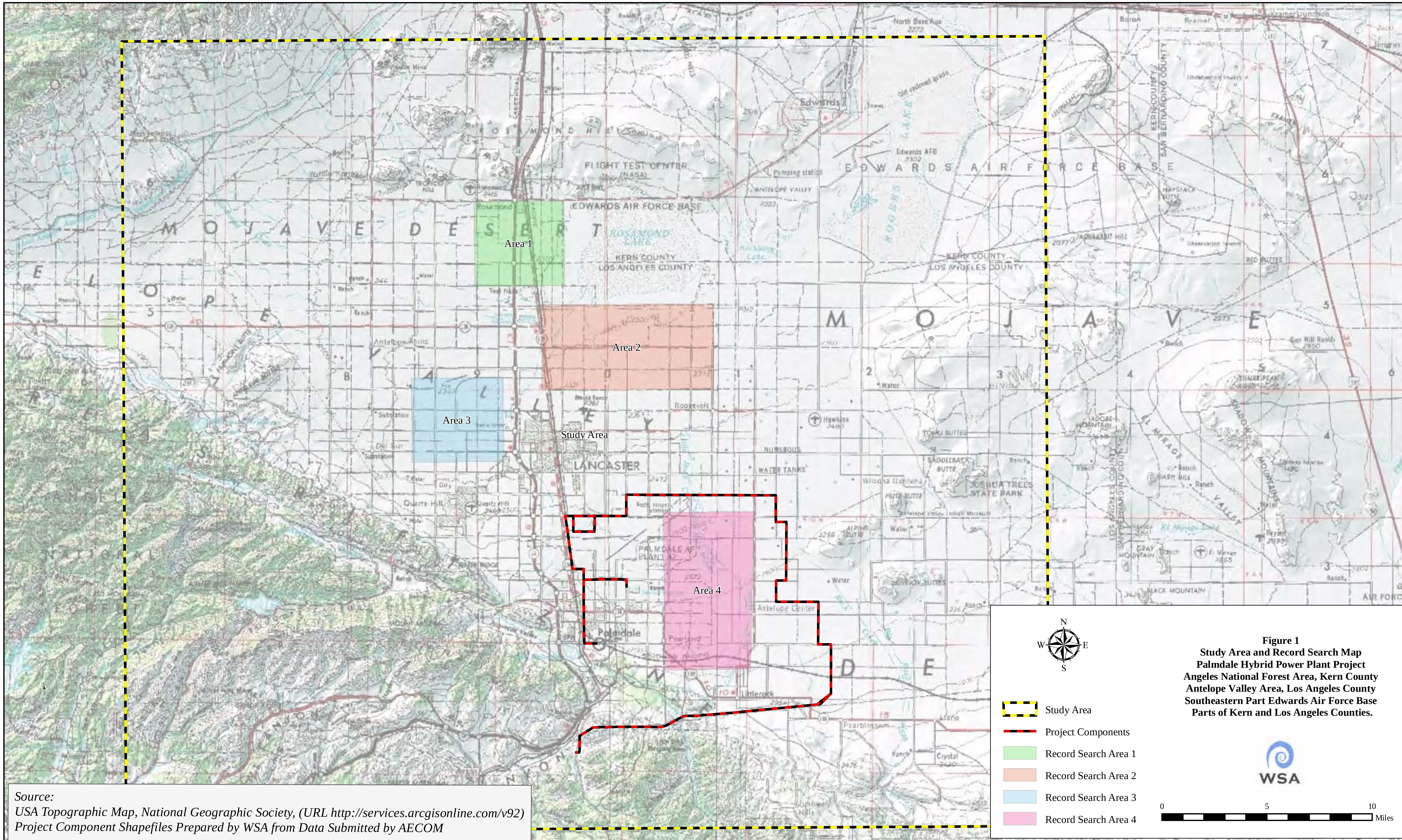
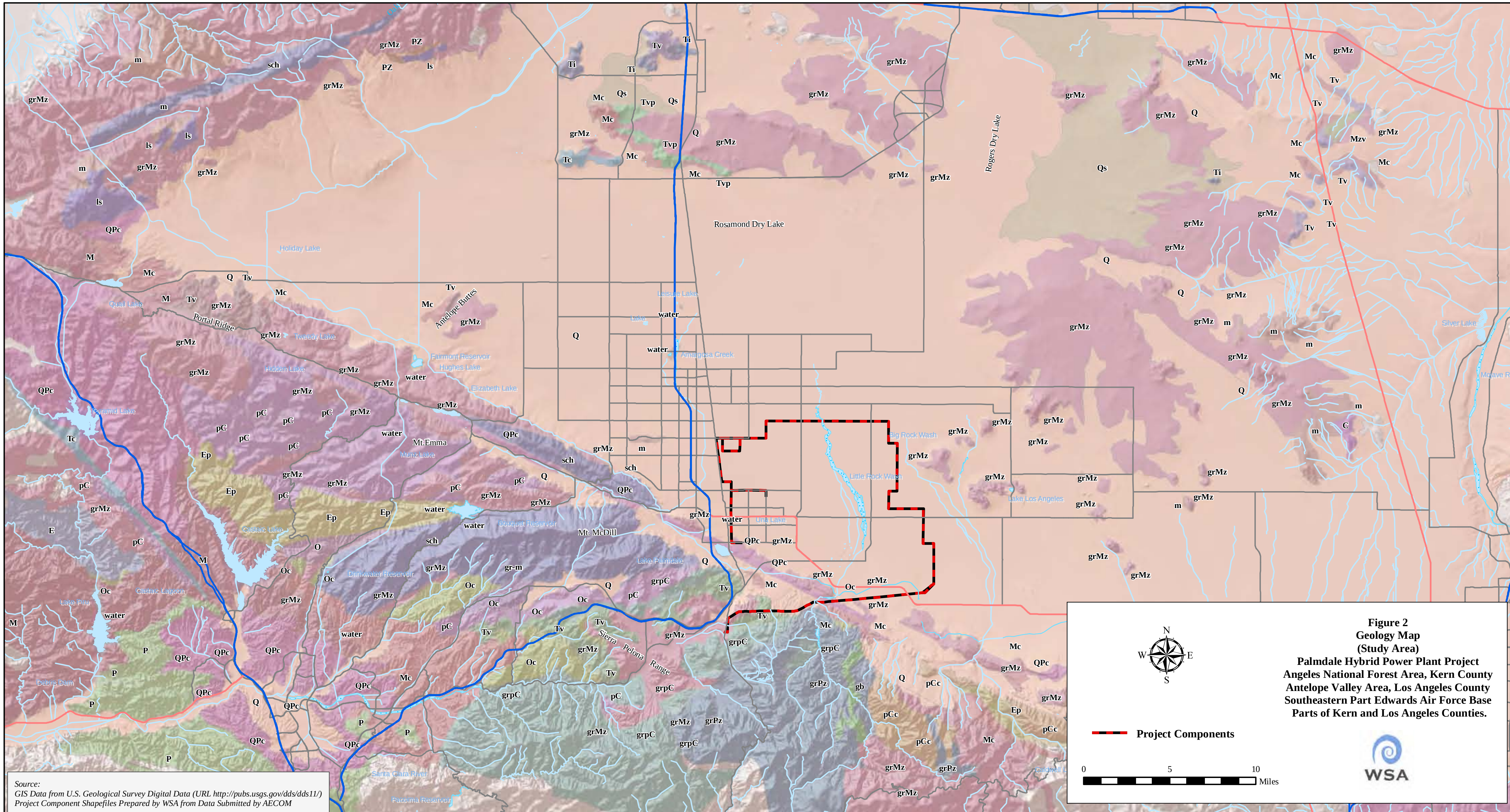
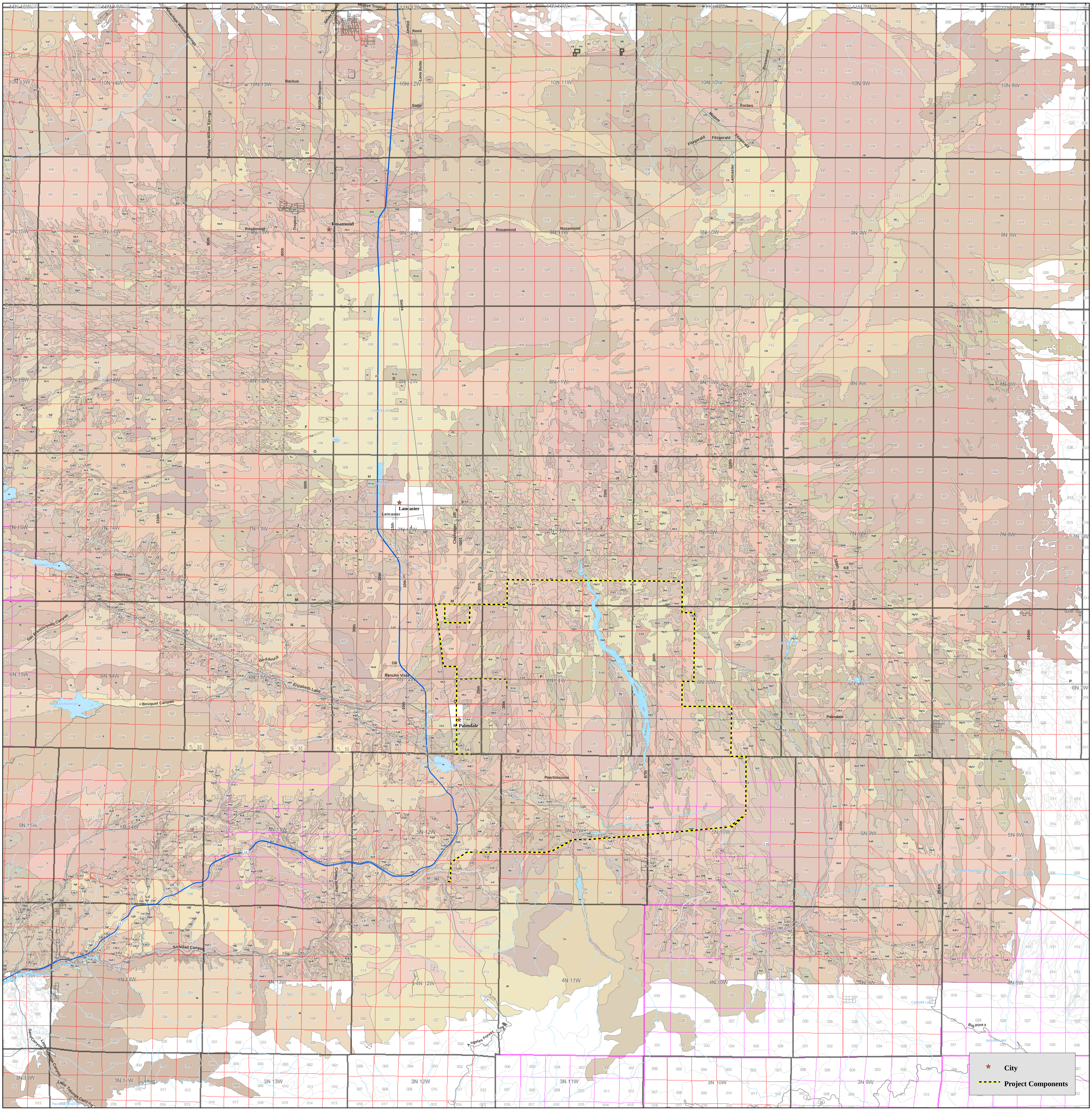


Figure 1
Study Area and Record Search Map
Palmdale Hybrid Power Plant Project
Angeles National Forest Area, Kern County
Antelope Valley Area, Los Angeles County
Southeastern Part Edwards Air Force Base
Parts of Kern and Los Angeles Counties.
Study Area
Project Components
Record Search Area 1
Record Search Area 2
Record Search Area 3
Record Search Area 4
N
S
E
W
0
5
10
Miles
WSA
Area 1
Area 2
Area 3
Area 4
Study Area
LANCASTER
Palmdale
EDWARDS AIR FORCE BASE
FLIGHT TEST CENTER (NASA)
ROSAMOND LAKE
KERN COUNTY
LOS ANGELES COUNTY
M O J A V E D E S E R T
Source:
USA Topographic Map, National Geographic Society, (URL http://services.arcgisonline.com/v92)
Project Component Shapefiles Prepared by WSA from Data Submitted by AECOM



Code, Unit Age, Description

- water, Holocene,
- sch, Late Cretaceous to Eocene, mica schist
- pCc, Early Proterozoic to Miocene, granitoid
- pC, Early Proterozoic to Miocene, granitoid
- m, Early Proterozoic to Cretaceous, gneiss
- ls, Paleozoic to Mesozoic, marble
- grpC, Middle Proterozoic, gabbro
- grPz, Late Triassic, quartz monzodiorite
- grMz, Permian to Tertiary; most Mesozoic, quartz monzonite
- gr-m, Early Proterozoic to Late Cretaceous, gneiss
- gb, Triassic to Cretaceous, diorite
- Tvp, Tertiary (4-22 Ma), dacite
- Tv, Tertiary (4-22 Ma), basalt
- Tv, Tertiary (22-24 Ma), pyroclastic
- Tv, Tertiary (19-23 Ma), andesite
- Ti, Tertiary, basalt
- Tc, Paleocene to Pliocene, sandstone
- Qs, Quaternary, lake or marine deposit (non-glacial)
- QPc, Miocene to Pleistocene, conglomerate
- Q, Pliocene to Holocene, terrace
- PZ, Late Proterozoic to Jurassic, sandstone
- P, Miocene to Pleistocene, mudstone
- Oc, middle Eocene to early Miocene, conglomerate
- O, Eocene to Miocene, mudstone
- Mzv, Triassic to Cretaceous, intermediate volcanic rock
- Mc, Oligocene to Pleistocene, conglomerate
- M, Oligocene to Pliocene, mudstone
- Ep, Paleocene, mudstone
- E, Paleocene to Oligocene, sandstone
- C, Late Proterozoic to Pennsylvanian, limestone



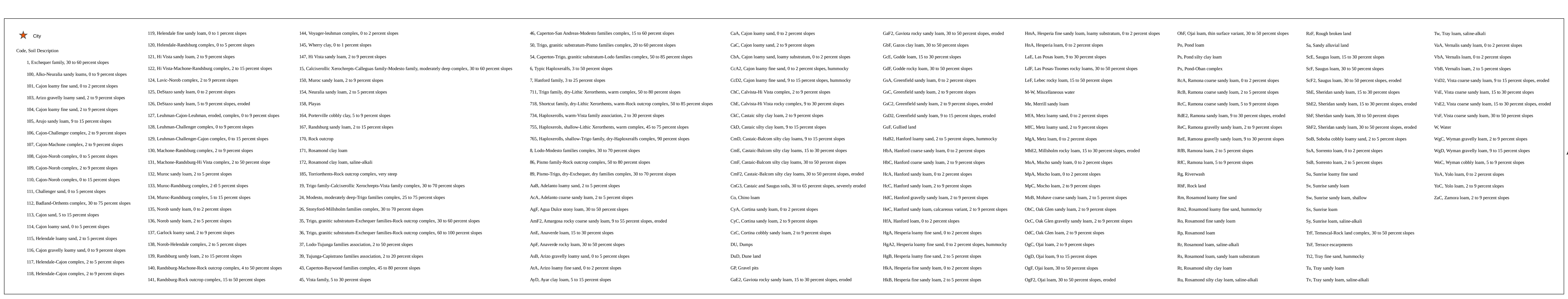


Figure 3
Soils Map
Palmdale Hybrid Power Plant Project
Angeles National Forest Area, Kern County
Antelope Valley Area, Los Angeles County
Southeastern Part Edwards Air Force Base
Parts of Kern and Los Angeles Counties.

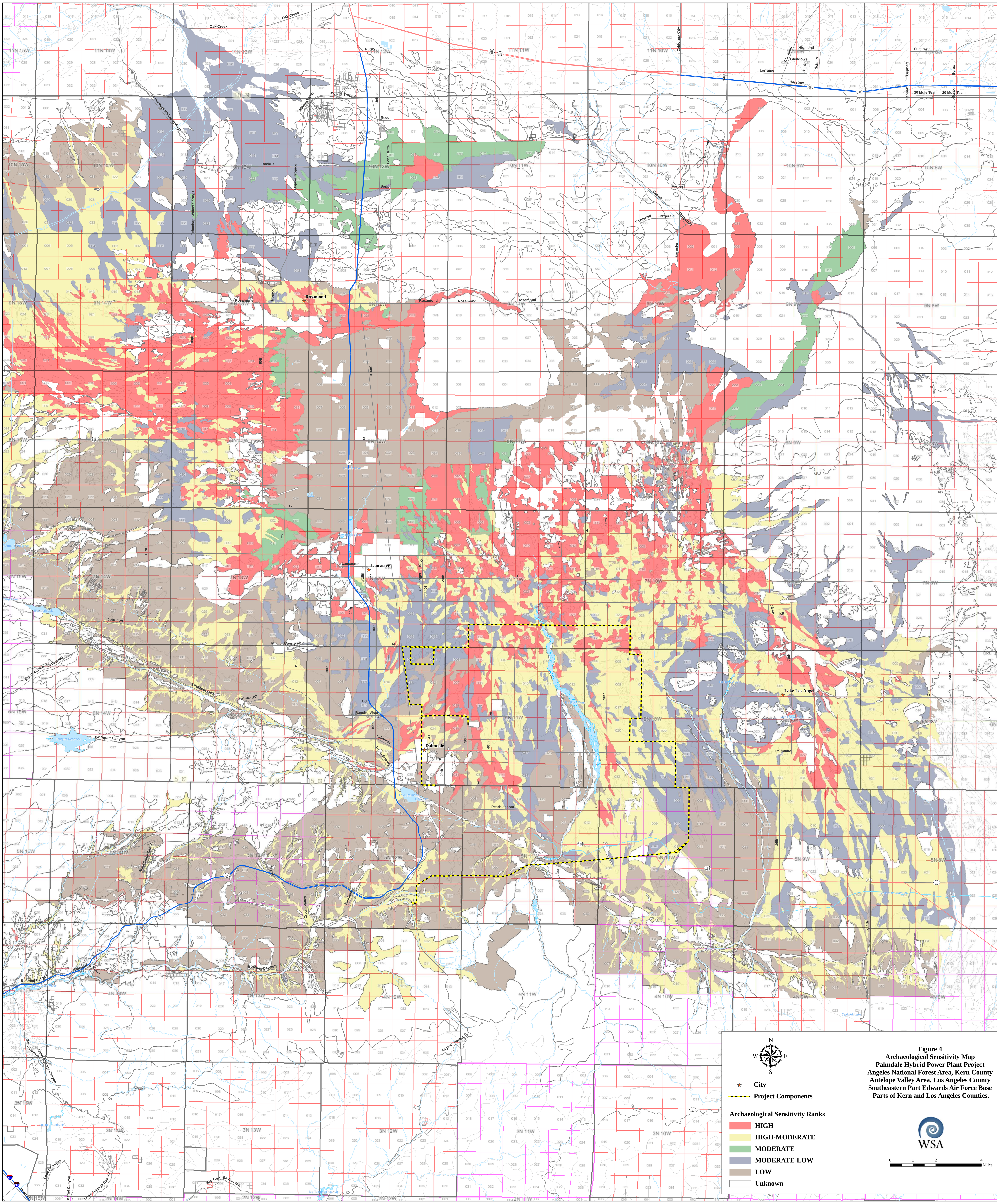


Figure 4
Archaeological Sensitivity Map
Palmdale Hybrid Power Plant Project
Angeles National Forest Area, Kern County
Antelope Valley Area, Los Angeles County
Southeastern Part Edwards Air Force Base
Parts of Kern and Los Angeles Counties.

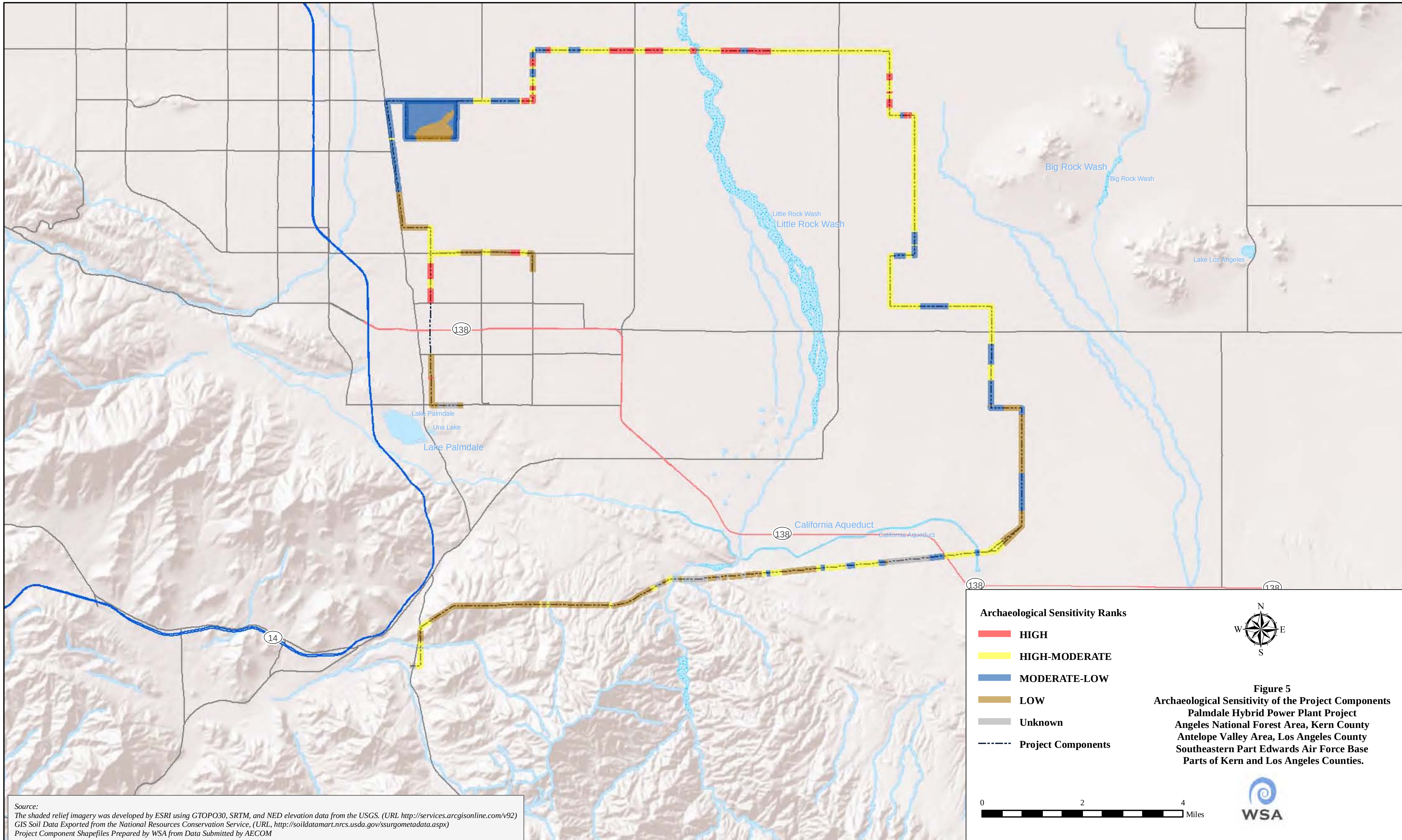


Figure 5
Archaeological Sensitivity of the Project Components
Palmdale Hybrid Power Plant Project
Angeles National Forest Area, Kern County
Antelope Valley Area, Los Angeles County
Southeastern Part Edwards Air Force Base
Parts of Kern and Los Angeles Counties.

Soils and Geomorphology Summary

For

Archaeological Sensitivity

Palmdale Hybrid Power Project,

Antelope Valley, Los Angeles County, California

Prepared By

Dave DeVries

Mesa Technical, Inc.

MESA TECHNICAL

2630 HILGARD AVENUE

BERKELEY, CALIFORNIA 94709-1002
TEL: 510.845.7830

Member, American Cultural Resources Association

SOILS & GEOMORPHOLOGY SUMMARY FOR ARCHAEOLOGICAL SENSITIVITY

PALMDALE HYBRID POWER PROJECT,

ANTELOPE VALLEY, LOS ANGELES COUNTY, CALIFORNIA

Introduction.

This report presents a summary of information obtained from examination of limited soils, geotechnical, and archaeological literature for a portion of the Antelope Valley in the vicinity of Palmdale, California, for the purpose of evaluating archaeological sensitivity for buried cultural features, within soils and sediments to be impacted by development of the PHPP. In addition to that area actually to be disturbed by construction of the plant and its laterals, our study considers a wider geographic area, to address the occurrence of buried archaeological sites in similar geomorphic positions.

Our study area, as defined in the following paragraph, encompasses almost 800 square miles of arid and semi-arid landforms, a vast area. The reader must understand that the following report contains broad inferences and unverified generalizations about huge landforms, widespread soil types, and broad-brush characterization of the potential for buried archaeological sites within these landforms, soils, and sediments.

General Setting.

The project area is located in the southwestern part of the Antelope Valley, in the Mojave Desert, approximately 40 miles northeast of Los Angeles. For purposes of this report, we define the “project area” as the area of potential effects (APE) for the power plant and its linears (transmission lines, water lines, etc.), but we define the “study area” for geomorphology more broadly, as a larger area that contains good examples of the types of terrain and alluvial/colluvial deposition that would be of interest to other professionals working nearby. Specifically, the north boundary of the PHPP study area is the Kern-Los Angeles county line, which runs east and west, three miles south of the town of Rosamond. The east boundary of the PHPP study area is the east edge of Range 9W, extending south to Holcomb Ridge and the edge of the Angeles National Forest, including the Big

Rock Wash alluvial fan. The west boundary of the PHPP study area follows the San Andreas Fault rift zone to the east edge of Range 15W, but also includes the “project” transmission line footprint in Townships 5N R11W and 5N R12W. The south boundary of the PHPP study area is the east edge of R15W, past Antelope Buttes to the north boundary of Township 8N.

At the southwestern edge of the PHPP study area are the steep, high, chaparral-covered foothills of the Sierra Pelona, Mt. Emma, Mt. McDill, and Grass Mountain. Steep-sided canyons have been incised into the northeast-facing flank of the San Gabriel Mountains by summer flash floods, winter debris flows, earthquake-induced landslides, and steady stream erosion over thousands of years. These canyons do not drain directly to the broad alluvial Antelope Valley, but instead terminate abruptly against the narrow, perpendicular, northwest-trending strike valley of the San Andreas Fault Zone, and the southwest-facing slopes of Ritter Ridge, Portal Ridge, and Holcomb Ridge.

In the project vicinity, runoff exits the San Andreas Rift Zone at the canyon mouths of Big Rock Creek, Little Rock Creek, Anaverde Creek, and Amargosa Creek. Enormous sediment loads transported during the Pleistocene and Holocene have created a bajada of coalescing and interbedded alluvial fans extending north and east from the canyon mouths, perpendicular to the fault zone, and terminating at the fan skirt in fine-textured basin rim deposits surrounding the Rosamond Dry Lake and Rogers Dry Lake playas. In addition to the major drainages, many smaller watersheds drain directly from the northeast flanks of Ritter Ridge and Holcomb Ridge, and have built small alluvial fans of their own along the baseline of the ridges.

The PHPP consturction will occur on mid and upper fan areas of these four drainages, and upon the uplands of the Sierra Pelona range between Little Rock Creek and Anaverde Creek. The best sources of archival information from which to evaluate the archaeological potential of soils and sediments to be disturbed by the PHPP are reports by professional archaeologists and soil survey maps prepared by the Natural Resources Conservation Service (NRCS) of the US Department of Agriculture (USDA) (formerly the Soil Conservation Service). Unfortunately, the cultural resource information centers at California State University (CSU) Bakersfield, CSU Fullerton, and base museum at Edwards Air Force Base (AFB) seem to have no records of buried archaeological sites in the PHPP study area; the data consist entirely of surface sites. The soil survey has detailed soil information and provides at least a good starting point for assessment of archaeological potential of the PHPP project area.

Soil Map Units of the PHPP study area and their potential to contain buried cultural materials.

The information and interpretations below are based upon review of the older Lancaster Area soil surveys (Carpenter and Crosby 1926; Woodruff, *et al*, 1970), and upon current USDA-NRCS geospatial data and soil series descriptions (NRCS, website URL).

Early reconnaissance soil surveys, from about 1900-1920, and the first series of more detailed countywide or agricultural district soil surveys (e.g., Carpenter and Crosby 1926) are outstanding sources because of their emphasis upon the collection of primary research data: the geomorphology, field observations, and horizon-by-horizon profile descriptions were obtained by Bureau of Soils career professionals, who worked outdoors most of the time, in that era before headlong suburban growth had reshaped the desert landscapes near Lancaster and Palmdale, and before natural fan channels and braided drainages, stream terraces and dunes had been graded or channelized. Such long-term, labor-intensive, and precise field work by teams of experts is now expensive and conducted rarely.

The newer soil surveys do not make the older surveys obsolete or irrelevant, but instead build upon that existing knowledge base. Map unit compositions and limits of soil series variability are now defined more rigorously than in the past, but in the field, the actual soil physical and chemical attributes remain constant. Many of the newer soil series (e.g., Arizo) have been separated taxonomically from their older parent series (Tujunga) on the basis of minor climatic regime differences, which are more relevant to agriculture than to archaeological interpretations for the Antelope Valley. The pre-World War II soil mapping work also was published with agricultural applications in mind, as the growth of Los Angeles and the development of pumped irrigation capacity in Antelope Valley promised to greatly expand and diversify the valley's agricultural industry. Yet, many of the physical and chemical soil attributes that early teams recorded are relevant and useful for today's archaeological sensitivity interpretations, particularly properties such as soil horizon colors, textures, descriptions of horizon boundaries and clay films, and interpretations of pedogenetic relationships (A-B-C1-C2 vs. A-C-2C-3C horizonation, for example), and drainage.

Below are brief descriptions and discussions of the archaeological potential of some major soil map units within the PHPP study area. Since there are an estimated 200 different digital polygon map units comprising the current soils map for the study area, the concentration here is upon soil series, types, and phases of the most widespread landforms, including those soils within the proposed PHPP footprint.

It should be noted that soil survey data represent field studies only to 60 to 80 inches in depth, the root zone for orchard crops. Alluvial fan sediments, of course, are much deeper and often have highly contrasting properties at greater depth, including the high probability of buried paleosols, which could contain archaeological features. Fans are fan-shaped because over time, channels, levees, terraces, and overbank areas wander over the fan surface, in response to the frequency and intensity of storms, and the amount of sediment transported. Landslides caused by earthquakes provide an additional source of sediment to the study area. Although the fans are deep and stratified, the archaeological potential interpretations below are based upon reported properties of the uppermost soils or sediments only. Younger fan deposits of medium-to-low depositional energy (i.e., of gravelly sand or finer texture) are quite likely to have covered older stable surfaces with a minimum of disruption and thus offer a higher probability of archaeological site preservation.

The ratings for archaeological sensitivity consider both a physical or geomorphological component and a cultural component, taken together as important factors. Geomorphological properties include the landform, its stratigraphy or horizonation, and the type of physical and chemical attributes present. There is an excellent correspondence between landform and soil/sediment properties, with the macro paleo-landform often not identifiable by shape, size, or topographic position alone, but also by micro-properties, such as the percent coarse fragments, angularity and bedding of the fragments, texture of the fine fraction, shape and abruptness of soil horizon boundaries, degree of B horizon development, color, pH, degree of calcium carbonate concentration or cementation, and type of salt content in saline soils.

The ratings for archaeological potential presented herein assign higher probability values to soils and landforms near resources, such as permanent water, food sources, such as fish and game, and raw materials for shelter, clothing, and technology (Table 1). Soils in upland valleys, soils near upper-fan canyon mouths, and soils near fresh-water channels within a short distance of the former Rosamond Lakeshore, particularly sand dunes amid a formerly marshy environment, receive a higher rating for the cultural component of archaeological potential than soils at mid-fan elevation, which are subject to lack of surface flow during the year, and offer relatively little in the way of food or other resources, as compared to soils of the uplands, canyon mouths, or basin rim. The ratings for archaeological potential are divided into five categories: High sensitivity areas are those that in prehistory would have been in close proximity to natural resources, such as water, game and plants, and that offered stable living surfaces (e.g., dry ground) for human populations and that today have been impacted by low-energy depositional processes; High-to-Moderate sensitivity are those areas that possess high-sensitivity characteristics but are in shallow soil contexts, such as areas subject to deflation from high wind erosion; Moderate sensitivity are those areas that were once in close proximity to water (e.g., along drainages), but were in less advantageous living areas outside of canyons and marsh areas; Moderate-to-Low sensitivity areas are those that possess moderate sensitivity characteristics but are in shallow soil contexts, such as those subject to deflation from high wind erosion; Low sensitivity areas are those that were distant from natural resources and that offered unstable living surfaces (e.g., surfaces that were under water during times of prehistoric settlement) or in areas that today are impacted by high-energy depositional processes.

Conclusions

Interpretations of archaeological sensitivity presented here have been developed from analysis of soil series properties, and from geomorphic characteristics, such as proximity to natural resources (e.g. distance to fresh water.) In considering the physical landscape can only provide a limited view of the potential for the existence of buried artifacts. Likewise, applying a simple screen or cultural filter for basic necessities such as water and food to the soil map units cannot possibly account for the effect of abstract variables, such as cultural history, tradition, and religion, on land use patterns. Therefore, rigorous applications of these sensitivity ratings should be made cautiously.

Table 1. Archaeological Sensitivity Rating of Map Units in the PHPP Study Area

Archaeological Sensitivity Rating	Map Unit Name, Code and Description			Rating Rationale
HIGH	Hanford family, 3-25% slopes	7	This is a broadly typed, unphased Forest Service map unit. The soils occur along the south edge of the project, in sandy canyon bottoms on the Angeles Forest. This is a very young soil of recent granitic alluvium.	The archaeological potential for buried sites in these upland canyons is HIGH. The rate of accumulation of alluvium from winter rains can be high and prolonged, and the relatively low-energy depositional environment, as indicated by the lack of stones or cobbles in the profile, would promote the gentle, intact burial of artifacts. Sandy canyon bottoms in the hills also offer dry ground, good campsites, and a cooler climate than the desert, near water and game. [see also Hanford, below]
	Leuhman-Challenger complex, 0-15% slopes.	129	This map unit appears on the Edwards AFB soil map as a wide swath of basin soil adjacent to the southeast edge of Rogers Dry Lake. Challenger soils are Aeolian dune sand over lacustrine deposits; Leuhman soils are sodic lacustrine deposits with columnar structure in the B horizon.	Challenger soils have a HIGH archaeological potential to contain buried sites, because they provided a dry living environment within a formerly marshy, game rich lake. Leuhman soils have LOW archaeological potential for buried sites, because they were under water during the process of parent material accumulation.
	Dune land	DuD	These are low hills of windblown sand in the eastern part of the study area, near Alpine and Lovejoy Buttes, a response to prevailing westerly winds.	Archaeological potential for buried sites is HIGH at distal fan edges, at the sites of formerly marshy shores of Rosamond and Rogers Lakes. These lakeside dunes are surrounded by stiff saline clay soils that are hard to work, and damp or wet most of the time, whereas the dunes would provide dry, easy to dig sites close to fish & game. Site CCo647, for example, contained over 100 burials in a dune, in a marshy environment. Archaeological potential for buried sites is LOW in the southern part of the study area, because better living sites are available right on the banks of the drainages.
	Hanford coarse sandy loam, 0-2% slopes.	HbA	[See below]	[See below]

Archaeological Sensitivity Rating	Map Unit Name, Code and Description			Rating Rationale
HIGH	Hanford coarse sandy loam, 2-9% slopes.	HbC	The Hanford soils are young, loamy, upper fan deposits, quite similar to the Cajon soils except with finer texture, thicker horizons and more gradual horizon boundaries. Hanford soils occur in stream canyons in the southern uplands of the project area, and on the northeast facing colluvial toe slopes of Ritter and Holcomb Ridges.	The archaeological potential for buried sites is HIGH in upland stream canyons and on upper fans near canyon mouths, but LOW on toe slopes of ridges. Buried features at CA-Riv-6853 were found in Hanford soils near a canyon mouth, where we also personally witnessed the steady accumulation of over 6 inches of Hanford parent material following one storm. Artifacts remained *in situ* when buried. Archaeological potential along alluvial and colluvial toe slopes is LOW, because of the cultural factor, there being more desirable sites near permanent water sources.
	Hanford sandy loam, 2-9% slopes	HcC	[See above]	[See above]
	Hanford gravelly sandy loam, 2-9% slopes	HdC	[See above]	[See above]
	Sorrento loam, 2-5% slopes.	SsB	Formed in alluvium from sedimentary rocks. A-Bk-2C horizonation. Heavy loam A & B over 2C of loamy fine sand.	HIGH archaeological potential for buried sites; occupies a narrow zone within San Andreas fault zone near head of Anaverde Creek fan. Culturally desirable location. 2C horizon could be a formerly stable surface now covered with new alluvium, perhaps from an earthquake induced landslide, as occurred a few miles away at LAN-953 (Beth Padon, paper presented at SCA, March 2009). Limey masses at Bk horizon depths, indicating some stability, but no Bt horizon, so these soils are not too old to have buried sites.
	Tray fine sand, hummocky.	Tt2		Archaeological potential HIGH for buried sites. Occurs on higher parts of basin rim with better drainage, thus drier and better for camps, etc. than surrounding soils.
HIGH-to-MODERATE	Pond loam.	Po	Extreme fan skirts; basin rim. A-Bt-C horizonation. Saline, slightly sodic, but moderately well drained and usually dry.	Overall, archaeological sensitivity is MODERATE, but rolling or hummocky areas have HIGH archaeological potential, because of low energy depositional process, cultural proximity to shore of former Rosamond Lake, and drier surface than the level areas. Shallowly buried archaeological sites are probably sparsely distributed over Po and Px map units, buried by windblown silt and fine sand.

Archaeological Sensitivity Rating	Map Unit Name, Code and Description			Rating Rationale
	Pond-Oban complex.	Px	These are salty soils of the outer basins, surrounding the dry lake playas. Saline progressing to saline-sodic as the playa is approached. pH 9.2 in Bt! This complex is about 50% Pond soil and 50% Oban and Tray soils. Oban soil, like the Pond soil, also has a well developed A-Bt-C profile probably underlain by lacustrine clays. Oban soils have columnar structure, with sticky, plastic consistence. Slow permeability, soils probably wet and soapy for long periods following rain, but these were formerly at the receding edge of Rosamond Dry Lake.	Archaeological potential MODERATE, except areas of hummocky Pond soil HIGH, as noted above. Former Edwards AFB archaeologist Rick Norwood (personal communication) discovered several shallowly buried sites on similar soils following a range fire that had destroyed protective vegetation, and subsequent wind erosion had scoured the soil surface. Several weeks later the sites had once again been buried.
	Hesperia loamy fine sand, 0-2% slopes.	HgA	The Hesperia series are mapped at upper fan canyon mouths, on terraces at mid-fan, and extending in smaller exposures down slope all the way to the basin rim. They are very young fan deposits, slightly more calcareous and of finer texture than the Hanford soils, having a very thin, practically nonexistent A, over a thick C, with only 0-15% gravel.	As with the Hanford soils, the archaeological potential for buried sites is HIGH on upper fan terraces near the Big Rock, Little Rock, and Amargosa canyon mouths, and MODERATE on mid-fan and lower situations. Again, though the soil characteristics are favorable for site burial and preservation of spatial integrity, there would seem to be better cultural locations available either upstream or downstream.
HIGH-to-MODERATE	Hesperia loamy fine sand, 0-2% slopes, hummocky	HgA2	[See above]	[See above]
	Hesperia fine sandy loam, 0-2% slopes.	HkA	[See above]	[See above]

Archaeological Sensitivity Rating	Map Unit Name, Code and Description			Rating Rationale
	Hesperia fine sandy loam, 2-5% slopes.	HkB	[See above]	[See above]
	Hesperia fine sandy loam, loamy substratum, 0-2% slopes.	HmA	[See above]	[See above]
	Hesperia loam, 0-2% slopes.	HnA	[See above]	[See above]
MODERATE	Cajon sand, 5-15% slopes	113	This map unit appears on the Edwards AFB soil map as a wide swath of mid-fan soil to the north of Rosamond Dry Lake.	The archaeological potential for buried sites is MODERATE near present and former drainage channels. The less turbulent depositional environment of the Cajon soils is evident in the abrupt and clear horizon boundaries separating the strata. Therefore artifacts, if present, remain *in situ* when buried. [see also Cajon, below].
MODERATE	Cajon loamy sand, 0-2% slopes.	CaA	These are young, upper, and mid-fan deposits representing a less energetic depositional environment than the Arizo soil deposits, perhaps overbank deposits near natural levees, rather than turbulent rills or quiet floodplains. Cajon soils are sandy entisols with A-C-2C horizonation, with abrupt or clear lower horizon boundaries separating numerous thin, discrete depositional events; 10-35% gravel; deposits are usually down fan from Arizo deposits. Cajon soils are a common mid-fan deposit on all the medium or larger drainages, in the eastern and western parts of the study area, the plant site, and along the transmission line route.	The archaeological potential for buried sites is MODERATE near present and former drainage channels, becoming lower as distance from those channels increases, and higher to the south, approaching canyon mouths. The less turbulent depositional environment of the Cajon soils is evident in the abrupt and clear horizon boundaries separating the strata. Therefore artifacts, if present, remain *in situ* when buried.

Archaeological Sensitivity Rating	Map Unit Name, Code and Description			Rating Rationale
	Cajon loamy sand, 2-9% slopes	CaC	[See above]	[See above]
	Cajon loamy sand, loamy substratum, 0-2% slopes	CbA	[See above]	[See above]
	Cajon loamy fine sand, 0-2% slopes, hummocky.	CcA2	[See above]	[See above]
MODERATE	Tray sandy loam, saline-alkali.	Tv	Basin rim soil. pH 9.5! Has a weaker, coarser Bt horizon than the Pond & Oban soils; probably not so old that archaeological sites couldn't be buried beneath.	Archaeological potential MODERATE for buried sites (see notes for Pond-Oban complex).
	Tray sandy loam.	Tu	[See above]	[See above]
	Tray loam, saline-alkali.	Tw	[See above]	[See above]
MODERATE-TO-LOW	Rosamond loamy fine sand. [no slope class given]	Rm	[See below]	[See below]
	Rosamond loamy fine sand, hummocky.	Rm2	[See below]	[See below]
	Rosamond loam. [no slope class given]	Rp	[See below]	[See below]

Archaeological Sensitivity Rating	Map Unit Name, Code and Description			Rating Rationale
MODERATE-TO-LOW	Rosamond fine sandy loam. [no slope class given]	Ro	The Rosamond soils are on alluvial fan terraces and floodplains in the 4 to 9 inch rainfall zone, occurring throughout the project area at outer, low-energy edges of deposition zones, whether near canyon mouths at the south project area, or on distal fan skirts near Rosamond Lake. C-2C-3C-4C horizonation, often with no A! Contrasting textures of fine sandy loam over silty clay loam over loam. No Bt horizon.	Archaeological potential for buried sites is HIGH on upper fan locations, because of multiple, shallowly buried surfaces near flowing fresh water, and low energy of deposition. Mid-fan potential, such as near the northern part of the transmission line, is LOW, for lack of cultural desirability. Lower fan potential is MODERATE, especially southeast of Rosamond Lake, as dunes and relatively frequent water flow from Big Rock and Little Rock Creeks make the area more desirable culturally than areas of Pond-Oban complex southwest of the lake. More frequent water flow is indicated by the lack of a Bt horizon, and the superposed but independently deposited C horizons.
LOW	Haploxerolls, shallow, Trigo family; dry Haploxeralfs complex	765	These are thin soils on bedrock, some having a dark, organic rich A horizon, and others having a clayey Bt horizon. These soils also occur along the transmission line route at the south part of the project.	They have LOW archaeological potential for buried sites, because they are so steep and shallow.
	Adelanto coarse sandy loam, 2-5% slopes.	AcA	These soils are older fan deposits and also occur on stream terraces, found at the plant site and the western part of the project area. They are mainly a deposit of the Amargosa Creek fan and the Anaverde Wash. Argid A-Btk-Bt-C horizonation, with clay films & strongly effervescent lime as soft masses in Btk; Bt weathered to reddish-brown.	The archaeological potential for buried sites is LOW, because these soils are probably too old and stable a deposit to have artifacts or sites beneath. The reddish-brown weathering of the Bt horizon, as well as lime in soft masses rather than as spots, stringers, or as a diffuse invisible presence indicates a moderately long stable period of undisturbed soil formation.
LOW	Amargosa rocky coarse sandy loam, 9-55% slopes, eroded.	AmF2	This is a residual soil of hilly uplands. Shallow, about 18 inch deep over granitic bedrock.	LOW archaeological potential for buried sites.

Archaeological Sensitivity Rating	Map Unit Name, Code and Description			Rating Rationale
	Arizo gravelly loamy sand, 0-9% slopes.	AsB	[See below] Also occurs at Big Rock and Little Rock washes, on slightly steeper slopes closer to the hills.	[See below]
	Arizo (very gravelly to extremely gravelly subsoil) loamy fine sand, 0-2% slopes.	AtA	This is a young, fan head, first terrace deposit adjacent to wash channels; 35%-85% gravel. This soil has had no time to develop horizonation other than a very weak calcareous B; A-Bk-C (C1-C2-C3 in the 1970 pub.), with strongly effervescent lime in the Bk (but no masses) and an extremely gravelly subsurface. Arizo soils occur at the east part of the project, along energetic Big Rock and Little Rock washes, as the outflow from relatively large watersheds; it is not mapped at the Amargosa Creek fan or the Anaverde Wash fan.	The archaeological potential for buried sites is LOW, because Arizo soil's energetic depositional environment either causes artifacts to be carried away in the flood, or disturbs the potential site vertically and horizontally.
	Gaviota rocky sandy loam, 15-30% slopes, eroded	GaE2	The Gaviota soil has a shallow, A-R lithic profile, 6 to 20 inches to sandstone parent material. These soils occur on uplands in the west central part of the study area, just south of Palmdale.	Archaeological potential for buried sites is LOW, because of shallow depth to bedrock.

Archaeological Sensitivity Rating	Map Unit Name, Code and Description			Rating Rationale
LOW	Greenfield sandy loam, 0-2% slopes.	GsA	The Greenfield soils developed on older fan and terrace deposits, on upper fans in the moister, 9- to 12-inch rainfall zone just northeast of Ritter Ridge and Holcomb Ridge. The Greenfield soils, along with associated Ramona soils and Hanford soils, receive enough leaching moisture to be free of $CaCO_3$. The Greenfield soils have a well developed profile with A-B-Bt-C horizonation, gradual horizon boundaries, and patchy clay films in the Bt.	Their archaeological potential for buried sites is LOW. The Greenfield soils are probably too old to have sites beneath. The accumulation of illuvial clay in a textural Bt horizon, as well as the existence of clay films, argues for a rather long period of site stability.
	Greenfield sandy loam, 2-9% slopes.	GsC	[See above]	[See above]
	Las Posas loam, 9-30% slopes.	LaE	Shallow, lithic residual soils.	Archaeological potential LOW for buried sites. See Las Posas, above. Also soils are erosion prone.
	Ramona coarse sandy loam, 2-5% slopes.	RcB	Soils of the upper fans, with 9- to 12-inch rainfall, an older fan or terrace deposit with reddish Bt horizons. A well developed Haploxeralf, sandy loam over loam over clay loam, with A-B1-B2t-B3-C horizonation. Occurs mostly on southern edge of project area, on ridge side slopes and colluvial slides.	Archaeological potential for buried sites is LOW, because this deep soil with well developed horizonation has been stable for a long time; Ramona soils are probably too old for buried deposits.
LOW	Ramona coarse sandy loam, 5-9% slopes.	RcC	[See above]	[See above]

Archaeological Sensitivity Rating	Map Unit Name, Code and Description			Rating Rationale
	Ramona sandy loam, 9-30%, eroded.	RdE2	[See above]	[See above]
	Ramona gravelly sandy loam, 9-30% slopes.	ReE	[See above]	[See above]
	Riverwash.	Rg	Channel and bar deposits.	Archaeological potential LOW, from energetic, turbulent downcutting.
	Soboba cobbly loamy sand, 2-5% slopes.	SoB	Head of fan at Little Rock Ck. A-C horizons. High percent of coarse rock fragments, 35%-75% below 11 inches depth.	LOW archaeological potential for buried sites, because of scouring and high energy depositional environment.
	Vista coarse sandy loam, 30-50% slopes; and 30-50% slopes, eroded.	VsF, VsF2	Vista coarse sandy loam, 30-50% slopes; and 30-50% slopes, eroded. Hills & mountainous uplands near Anaverde Creek outlet, and other colluvial outfalls along Ritter Ridge & Holcomb Ridge. Also occurs on Pelona Ridge uplands, at extreme southwest terminus of transmission line. Inceptisol. A-Bw-Cr horizonation, a residual soil formed directly on granitic parent material.	Archaeological potential is LOW, because Vista soils are only 20-40 inches deep to rock, and are not formed by alluvial processes. Also many krotovina are reported from the B horizon, which would ruin stratigraphy.
LOW	Vista variants having less slope.	VsD, VsD2, VsE	[See above]	[See above]

REFERENCES

Barrows, A. G., 1980, Geologic map of the San Andreas fault zone and adjoining terrane, Juniper Hills, California. California Division of Mines and Geology Open File Report, OFR 80-2 LA, scale 1:9600.

Bortugno, E. J. and T. E. Spittler, 1998, Geologic Map of the San Bernardino Quadrangle, California. State of California, Department of Conservation, Division of Mines and Geology, Regional Geologic Map Series, 5 sheets, revised ed., scale 1:250,000.

Carpenter, E. J. and S. W. Cosby, 1926, Soil Survey of the Lancaster Area California. [Advance sheets - Field Operations of the Bureau of Soils, 1922.] Washington, Government Printing Office. Scale 1:63,360.

Dibblee, T. W., Jr., 1959, Geologic map of the Alpine Butte quadrangle, California. U.S. Geological Survey Mineral Investigations Field Studies Map MF-222, scale 1:62,500.

Dibblee, T. W., Jr., 1967, Areal geology of the western Mojave Desert, California. U.S. Geological Survey Professional Paper 522, scale 1:125,000.

Dibblee, T. W., Jr., 1960, Geologic map of the Lancaster quadrangle, Los Angeles County, California. U.S. Geological Survey Map MF-76, scale 1:62,500.

Jennings, C. W. and R. G. Strand, 1969, Geologic Map of California, Los Angeles sheet. State of California, Department of Conservation, Division of Mines and Geology. 2 sheets, scale 1:250,000.

Noble, L. F., 1953, Geology of the Pearland quadrangle, California. U.S. Geological Survey GQ 24, scale 1:24,000.

NRCS (Natural Resources Conservation Service), current, Official Series Descriptions, http://soils.usda.gov/technical/classification/osd/index.html

NRCS (Natural Resources Conservation Service), current, Soil Survey of the Antelope Valley Area. digital spatial data. http://websoilsurvey.nrcs.usda.gov/app/ . Scale used for printout was approx. 1:95,000.

Woodruff, G.A., W.J. McCoy, and W.B. Sheldon, 1970, Soil Survey of the Antelope Valley Area, California. United States Department of Agriculture, Soil Conservation Service, in cooperation with the University of California Agricultural Experiment Station. Washington, D.C., Government Printing Office.

Data Request 127:

Please provide details on how and when the infiltration basins will be designed, built, and operated to discourage wildlife use.

Response:

The facility has been designed to provide stormwater management via four infiltration basins ranging in size from 0.87 to 5.38 acres of stormwater infiltration area. To discourage birds from congregating at the infiltration basins and meet Federal Aviation Administration (FAA) objectives, each infiltration basin conforms to FAA Advisory Circular 150-5200/33B, which provides guidance for project developers on land uses that have the potential to attract hazardous wildlife (e.g., creating aircraft hazards from bird strikes) on or near public-use airports. The FAA recommends that off-airport stormwater management systems located within the 10,000-foot separation area for turbine powered aircraft be designed and operated so as not to create aboveground standing water. Specifically, stormwater infiltration ponds must be designed, engineered, constructed, and maintained for a maximum 48–hour detention period after the design storm and must remain dry in between storms. To facilitate the control of potential hazards due to wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow and linearly shaped water detention basins.

Accordingly, the PHPP infiltration basins:

1) Will maintain a maximum detention time between rainfall events of no more than 48 hours;

2) Will drain completely and remain dry in between rainfall events;

3) Will be steep-sided (33 percent slope), maintaining at least 2 feet of freeboard, and lined along the bank with rip-rap; and

4) Will be narrow and linearly shaped as much as possible in accordance with site-specific constraints.

In addition, the entire site boundary will be provided with perimeter protection (i.e., chain-link and/or tortoise fencing) to keep out terrestrial wildlife.

The PHPP Conceptual Site Plan (see Attachment DR-138 in Land Use section) provides the proposed locations of the four PHPP infiltration basins.

The Applicant has performed detailed infiltration calculations and design models employing Darcy's Law, the Kozeny-Carman model, and Natural Resources Conservation Service published data, in order to confirm that site soils are capable of providing the required maximum (i.e., 48-hour) detention time for both 10-year and 100-year design storms. These calculations are provided in Attachment DR-143 (Traffic & Transportation section). In addition, during the pre-construction phase, the Applicant plans to perform field percolation tests to confirm the design assumptions used in the calculations and to ensure that the design of the four infiltration basins is in compliance with FAA guidance.

It should be noted that the area surrounding the PHPP site has historically had problems with periodic flooding after major rainfall events, particularly along Sierra Highway and East Avenue M, and the PHPP infiltration basin design will maximize stormwater infiltration, which reduces the potential for area flooding and storm flows to the existing drainage areas. This, in turn, reduces the amount of standing water after major rainfall events throughout the PHPP vicinity.

In addition to the engineering measures proposed above, the Applicant could also incorporate bird hazing techniques to ensure birds do not congregate during the short period of time (i.e., less than 48 hours) that the infiltration basins may contain water after storm events. These techniques could include visual and/or auditory devices to frighten the birds, including air or gas cannons, human flushing, bioacoustic deterrents, flags and streamers. Techniques also could be used in combination if birds adapt to one particular technique.

In order to emphasize the extremely low frequency of large rainfall events in Palmdale, please note that the infiltration basin 10-year (2.34 inches) and 100-year (2.75 inches) storm design basis values represent a major fraction of the total annual mean rainfall in Palmdale of 7.36 inches per year, based on the National Oceanic & Atmospheric Administration Climatological data that we are providing as Attachment DR-151 (Visual Resource section) . Moreover, one would need to go back more than 60 years to find dates where rainfall events exceeded the 10-year and 100-year storm events.

Data Request 128:

> Please provide an update of progress and a detailed schedule for the USFWS Section 7 or 10 consultation and process (include a discussion of federal nexus, if any).

Response:

On April 8, 2009, the Project Applicant submitted to the U.S. Environmental Protection Agency (EPA) its application for a Prevention of Significant Deterioration (PSD) permit. Included with the PSD application was a Biological Assessment and a request that EPA find that the Project may affect but is not likely to adversely affect desert tortoises and arroyo toads, both listed species under the federal Endangered Species Act (ESA). The Project Applicant also requested that EPA initiate consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA to request that the USFWS concur that the Project may affect but is not likely to adversely affect the federally listed species (please see Attachment DR-128).

On April 20, 2009, Kim McCormick (counsel for the Applicant) spoke with Ray Bransfield (USFWS), regarding the Biological Assessment. Ms. McCormick and Mr. Bransfield agreed that an addendum to the Biological Assessment will be prepared and submitted to EPA and USFWS, confirming that no desert tortoises or arroyo toads will be handled during Project activities and therefore no incidental take of those species will occur.

It is anticipated that EPA's determination, and USFWS's concurrence, that the Project may affect but is not likely to adversely affect federally listed species, will be obtained within 30 to 60 days.

Attachment DR-128, provided at the end of this section, includes a copy of the cover letter to the EPA for the PSD Permit Application and request for consultation and concurrence.

Data Request 129:

Please provide records of conversation, electronic mails, or other correspondence with CDFG regarding their expected compensation ratio and other mitigation measures for impacts to special-status species and their habitat.

Response:

Please see Attachment DR-128. On April 13, 2009, the Applicant submitted to the California Energy Commission (CEC) and the California Department of Fish and Game (CDFG) an *Application for Incidental Take of Endangered Species, Threatened Species, and Candidate Species,* pursuant to Section 2081 of the California Endangered Species Act, for incidental take of the state-listed Mohave ground squirrel (MGS). It is anticipated that discussions with CEC and CDFG Staff regarding compensation ratios and mitigation measures will continue once they have had an opportunity to review the Section 2081 application.

On April 20, 2009, Kim McCormick (counsel for the Applicant) spoke with Scott Harris (CDFG), regarding the Section 2081 application. Ms. McCormick confirmed that the Project Applicant is not seeking incidental take authorization for desert tortoise because no take of that species is anticipated.

Data Request 130:

Please provide the proposed landscape plan showing the placement of transplanted Joshua trees, California juniper, beavertail cactus, and golden cholla for the proposed project.

Response:

A conceptual landscape plan showing the placement of Joshua trees around the site boundary was provided in the CEC Data Request Set 1 Responses submitted on January 12, 2001 (see Attachment DR-80 of that submittal). A landscape plan showing the placement of transplanted Joshua trees, California junipers, and cacti will be prepared upon finalization of the Project design plans.

Data Request 131:

Please provide a discussion of the expected mitigation for impacts to Joshua tree woodland habitat (i.e., in addition to the planned transplantation required by the City ordinance).

Response:

On March 11, 2009, Matt Amalong (AMEC biologist) and Kim McCormick (counsel for the Applicant) spoke with Scott Harris (CDFG) and Kelly Schmoker (CDFG) regarding mitigation for Joshua tree woodland habitat (please see Attachment DR-128). Discussions with CDFG are ongoing regarding mitigation for Joshua tree woodland.

If desert tortoise and/or MGS mitigation lands are located within the vicinity of the Project and/or within the Antelope Valley, CDFG agreed they could also be used as mitigation for Joshua tree woodland impacts. CDFG also provided a list of Conservation Conservancies in the Antelope Valley that could be contacted regarding available Joshua tree woodlands (see Attachment DR-128).

Data Request 132:

> Please provide evidence of concurrence from USACE, CDFG, and RWQCB that the proposed project will not impact jurisdictional/permitted waters and/or summarize their recommendations regarding potential impacts and any associated permitting and impact avoidance requirements.

Response:

On April 20, 2009, the Applicant submitted to U.S. Army Corps of Engineers (USACE), CDFG and the Regional Water Quality Control Board (RWQCB) its *Preliminary Jurisdictional Determination and Delineation of Waters of the United States and Waters of the State of California* (JD Report). The JD Report identifies federal and state jurisdictional waters with the potential to be impacted by the Project, and demonstrates why no impacts will occur to federal or state jurisdictional waters. The Applicant requested concurrence from USACE, CDFG and RWQCB with this conclusion. The Applicant's correspondence with the agencies is included in Attachment DR-128 at the end of this section.

Data Request 133:

> Please consult with CDFG and provide a record of conversation regarding raven management and their requirements (if any) in addition to the in-lieu fee program of USFWS. Should a Plan be required, please provide the anticipated schedule for the completion of this document.

Response:

A discussion with the CDFG regarding raven management measures was held in conjunction with discussions regarding the Section 2081 application submitted on April 13, 2009. A separate raven management plan for specific Project impacts is not anticipated based on the lack of Project impacts to desert tortoise. Raven management measures designed to avoid attracting ravens to the Project site will be incorporated into the Project Biological Resource Implementation and Monitoring Plan. If a separate raven management plan is required, a draft will be prepared and submitted to CEC, CDFG and USFWS prior to issuance of the Final Staff Assessment.

Data Request 134:

Please provide the following information on the botanical survey methodology:

a. Dates of botanical surveys;

b. Names of personnel conducting botanical surveys;

c. For each person involved with the botanical surveys, list which specific day(s) they participated in the survey and approximate number of hours spent; and

d. Whether the botanical surveys were done exclusively looking for plants, or whether the same personnel conducted botanical surveys concurrently with wildlife surveys.

Response:

In the "Background" paragraph for Data Requests 134-136, CEC Staff writes:

- "CDFG has stated that 30-meter transect spacing, as described in Appendix H and correspondence with the Applicant's consultant, is inadequate for botanical surveys."

  It is not evident why CDFG believes the transect spacing was 30-meters. Please see AFC Section 5.3.2.4, AFC Appendix H Section 4.2, and the e-mail correspondence between AMEC, CDFG, and CEC (Attachment DR-134, page 1) – all three state 30-foot (not 30-meter) transects were used, which are adequate for the vegetation communities found on PHPP.

- "Many plants listed in Table 2 of Appendix H are noted as 'Absent. Not observed during focused surveys;' however, botanical surveys were not done for the entire Project area."

Botanical surveys were conducted throughout the entire power plant site and all linear facility right of ways (ROWs).

For dates, names, hours, etc., please see the table in Attachment DR-128 provided at the end of this section. The botanical surveys were conducted concurrently with wildlife surveys, as stated in AFC Section 5.3.2.4 and AFC Appendix H Section 4.2.

Data Request 135:

Please provide additional information (e.g., a discussion of soil types, suitable habitat, etc.) supporting the conclusions that plants in Table 2 of Appendix H are absent from the Project area.

Response:

This information (including soils types, suitable habitat, etc.) was presented in AFC Appendix H Section 5.2 and in Table 2 (Habitat and Distribution column). The conclusion that these plants are absent was made because focused surveys were conducted and these plants were not found.

Data Request 136:

> Please describe the characteristics used to distinguish the unidentified manzanita from San Gabriel manzanita and conclude that the special-status species was absent from the Project area.

Response:

After reviewing field notes and discussing the plant in question with the surveyor, the inclusion of *Arctostaphylos* sp. in the PHPP plant species list was an error due to a mistranslation of field notes. During the field surveys for the transmission line realignments in April 2009, the location of the plant in question was resurveyed (off site, outside of the transmission line Segment 2 ROW and impact area), and the plant was identified as Yerba Santa (*Eriodictyon trichocalyx var. trichocalyx*). Please see Attachment DR-136 for the updated list of plant species found on the PHPP.

Biological Resources

Attachment DR-128

Agency Contacts and Records of Conversation

AECOM Environment
1220 Avenida Acaso, Camarillo, CA 93012
T 805.388.3775 F 805.388.3577 www.aecom.com

March 31, 2009

Mr. Gerardo Rios
Chief, Permits Office (AIR 3)
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105

RE: Palmdale Hybrid Power Project (PHPP) Application for PSD Permit and Request for Endangered Species Act Consultation and Concurrence

Dear Mr. Rios:

AECOM Environment, on behalf of the City of Palmdale and Inland Energy, Inc., is submitting an application for a Prevention of Significant Deterioration (PSD) permit for the Palmdale Hybrid Power Project (PHPP). The PHPP is a hybrid power plant consisting of combined-cycle power plant integrated with 50 megawatts (MW) of solar arrays for a combined nominal output of 570 MW. Enclosed please find three copies of the PSD Application, as directed by Ms. Shirley Rivera of your staff.

The City and Inland Energy anticipate that the U.S. Environmental Protection Agency (EPA) will initiate consultation with the U.S. Fish and Wildlife Service (USFWS), pursuant to Section 7 of the Endangered Species Act of 1973, as amended, regarding potential impacts to listed species resulting from EPA's issuance of a PSD permit for the PHPP. We have enclosed three copies of a Draft[1] Biological Assessment for the Project to assist you with that consultation, which we anticipate will seek concurrence from the USFWS that the Project *may affect but is not likely to adversely affect* federally listed species.

We also have included CD's with electronic copies of the PSD Application, modeling files and the Draft Biological Assessment. An air quality impact analysis has been conducted to demonstrate that the PHPP will not cause or contribute to violations of the National Ambient Air Quality Standards (NAAQS) during routine operations. The enclosed PSD Application includes the details of this impact analysis.

The City of Palmdale submitted its Application for Certification (AFC) to the California Energy Commission (CEC) on August 4, 2008, and was deemed Data Adequate on October 8, 2008. The Application for a Determination of Compliance (DOC) to the Antelope Valley Air Quality Management

[1] The document is a "Draft" since we consider it up to the agencies to finalize. However, from our standpoint, this is a Final document.

District has also been deemed complete, and the District issued its Preliminary DOC on February 12, 2009.

The contacts at these agencies for the PHPP include:

- Ms. Felicia Miller, Project Manager, CEC, 916-654-4640, fmiller@energy.state.ca.us
- Mr. Bret Banks, AVAQMD, 661-723-8070, bbanks@avaqmd.ca.gov
- Mr. Ray Bransfield, USFWS, 805-644-1766, Ray_Bransfield@fws.gov

At the request of Ms. Shirley Rivera of your staff, we are also sending a copy of the PSD permit application to the U.S. Forest Service for their review, as the Federal Land Manager of the San Gabriel and Cucamonga Wilderness Class I Areas. We will also verify it the National Park Service would like a copy of the application.

We request that EPA work with these other agencies to coordinate the timeline for permit approvals and requirements.

Please call me at (805) 388-3775 if you have any questions or need additional information. We appreciate your assistance with this matter.

Sincerely

Sara J. Head

Sara J. Head, QEP
Vice President, AECOM Environment
Sara.head@aecom.com

Attachments: PSD Application (3)
Draft Biological Assessment (3)
Compact Disk (CD) with documents and modeling files (3)

cc: Ms. Shirley Rivera, EPA
Ms. Felicia Miller, California Energy Commission (with 1 copy of the attachments)
Mr. Trent Procter, U.S. Forest Service (with 1 copy of the attachments)
Mr. Alan De Salvio, Antelope Valley Air Quality Management District
Ms. Laurie Lile, City Manager, Palmdale
Mr. Tom Barnett, Inland Energy, Inc.
Mr. Tony Penna, Inland Energy, Inc.
Mr. Mike Carroll, Latham & Watkins
Ms. Kim McCormick, Law Offices of Kim McCormick

AECOM Environment
1220 Avenida Acaso, Camarillo, CA 93012
T 805.388.3775 F 805.388.3577 www.aecom.com

AECOM

April 8, 2009

Mr. Ray Bransfield
U.S. Fish and Wildlife Service
Ventura Field Office
2493 Portola Road, Suite B
Ventura, CA 93003

RE: Palmdale Hybrid Power Project (PHPP) Application for PSD Permit and Request for Endangered Species Act Consultation and Concurrence

Dear Mr. Bransfield:

AECOM Environment, on behalf of the City of Palmdale and Inland Energy, Inc., submitted an application for a Prevention of Significant Deterioration (PSD) permit for the Palmdale Hybrid Power Project (PHPP) last week to the U.S. Environmental Protection Agency (EPA) Region 9. The PHPP is a hybrid power plant consisting of combined-cycle power plant integrated with 50 megawatts (MW) of solar arrays for a combined nominal output of 570 MW.

The City and Inland Energy anticipate that the EPA will initiate consultation with the U.S. Fish and Wildlife Service (USFWS), pursuant to Section 7 of the Endangered Species Act of 1973, as amended, regarding potential impacts to listed species resulting from EPA's issuance of a PSD permit for the PHPP. While EPA is expected to provide you with a copy when initiating their consultation on the PHPP, I am enclosing a copy of the Draft[1] Biological Assessment for your review. Based on this BA, we anticipate that EPA will seek concurrence from the USFWS that the Project *may affect but is not likely to adversely affect* federally listed species.

The City of Palmdale submitted its Application for Certification (AFC) to the California Energy Commission (CEC) on August 4, 2008, and was deemed Data Adequate on October 8, 2008. We request that USFWS work with the EPA and CEC to coordinate the timeline for permit approvals and requirements.

---

[1] The document is a "Draft" since we consider it up to the agencies to finalize. However, from our standpoint, this is a Final document.

Please call me at (805) 388-3775 if you have any questions or need additional information. We appreciate your assistance with this matter.

Sincerely

Sara J. Head, QEP
Vice President, AECOM Environment
Sara.head@aecom.com

Attachments: Draft Biological Assessment

cc: Ms. Shirley Rivera, EPA

The following provides a description of a discussion between Matt Amalong (AMEC Wildlife Biologist), Kim McCormick (legal representation for client), Scott Harris (CDFG Biologist), and Kelly Schmoker (CDFG Biologist) on March 11, 2009.

Scott Harris
CDFG
626-797-3170
spharris@dfg.ca.gov

Kelly Schmoker
CDFG
626-792-1680
kschmoker@dfg.ca.gov

Topic: Mitigation for desert tortoise (DT), Mohave ground squirrel (MGS), and Joshua tree (JT) woodland

Discussion:

- CDFG recommends conducting additional protocol surveys in 2009 for DT if construction will not begin within one year of the 2008 surveys (April 2008), unless the Project is assuming DT are present. However, if USFWS agrees that additional protocol surveys are not necessary, CDFG will concur.
- CDFG would like a 2:1 ratio for high quality MGS habitat and a 1:1 ratio for marginal MGS habitat. CDFG indicated they would consider a lower ratio than 2:1 for good quality habitat if biological data was provided by Phil Leitner to support a lower ratio. They also agreed to consider a different approach to mitigation, using Phil's carrying capacity analysis, if provided to them by Phil. Also, Phil should provide justification that the power plant site is an "isolated" habitat to support a 1:1 mitigation ratio even if the area is considered high quality MGS habitat.
- Mitigation for Project impacts to JT woodlands could range from a 1:1 to 2:1 ratio based on the quality of the mitigation lands. If high quality JT woodland mitigation lands are available in the vicinity of the Project site (CDFG thought unlikely), mitigation could be at a 1:1 ratio; otherwise the mitigation ratio could be higher (i.e. 2:1). AMEC requested that CDFG provide the basis for their recommendation that the ratio be higher than 1:1, which they agreed to do.
- If DT and MGS mitigation lands are located elsewhere outside the vicinity of the Project and outside Antelope Valley, they could not be used as mitigation for JT woodland impacts. CDFG would like JT woodland mitigation lands to be located in the Antelope Valley, in the Project vicinity. CDFG stated they would provide a list of Conservation Conservancies in the Antelope Valley that could be contacted regarding available JT woodlands. They recommend contacting the Conservancies soon because there are numerous projects that are rapidly acquiring available lands.
- CDFG agreed to review the methodology used for the 2008 plant surveys to determine whether any additional surveys need to be done in 2009.

AMEC Earth & Environmental, Inc.
3120 Chicago Avenue, Suite 110
Riverside, CA 92507
Tel +951-369-8060
Fax +951-369-8035
www.amec.com

Amalong, Matt L

From: Scott P. Harris [spharris@dfg.ca.gov]
Sent: Wednesday, April 08, 2009 4:21 PM
To: Amalong, Matt L
Subject: Re: BUOW Report

Matt,

You can just e-mail an attached file with the buow report to me if that works for you.
Otherwise a CD or hardcopy may be sent to me (one copy is fine) at:
1508 North Harding Avenue
Pasadena, CA (1104

Thank you for the reminder about the conservancies. Their info. is as follows:

Antelope Valley Conservancy
www.avconservancy.org
avconservancy@yahoo.com
661/943-9000
Wendy Reed Executive Director

Jim Dodson, Board Chair
661/733-8283
www.dmca.ca.gov
jim.dodson@verizon.net or

The D&MCA can be reached in care of the Antelope Valley Resource Conservation District:
44811 N. Date Ave., Suite G,
Lancaster, CA 93534

Phone (661) 945-2604 Ext. 107
Fax (661) 942-3305
Email: info@dmca.ca.gov
Website: www.avrcd.org

Please let me know if I can be of further assistance.

Scott

>>> "Amalong, Matt L" <Matt.Amalong@amec.com> 4/8/2009 8:45 AM >>>

Also, how many copies should we send? What about CDs with digital copies of the report?

Matt Amalong
Wildlife Biologist
AMEC Earth & Environmental, Inc.

1290 N. Hancock Street, Suite 102

Anaheim, CA 92807
(T) 714.779.2591
(C) 949.233.2134

(F) 714.779.8377
mailto:matt.amalong@amec.com <mailto:matt.amalong@amec.com>

The following provides a description of a discussion between Matt Amalong (AMEC Wildlife Biologist) and Scott Harris (CDFG Biologist) on April 16, 2009.

Scott Harris
CDFG
626-797-3170
spharris@dfg.ca.gov

Topic: 2081 Incidental Take Application

Discussion:

- CDFG stated that "Take" for DT would result in additional mitigation. To avoid "Take," conduct clearance surveys, fence work areas where DT may potentially occur, and if a DT is found, let it leave on its own.
- CDFG would like to see the DT and MGS survey methodology in the application.
- CDFG would like the mitigation measures for DT and MGS separated.
- A 1:1 mitigation ratio was proposed for the power plant site. Unless the acquired lands are equal quality habitat, CDFG would like a 2:1 ratio. CDFG will request the lands be acquired through the Desert Tortoise Preserve Committee.
- Security amounts need to be based on PAR (Property Analysis Record).
- CDFG will contact CEC to determine if CDFG should formally respond, and if so, to whom.

Topic: Swainson's Hawks and Raptor Mitigation

- CDFG stated that they typically request a 0.5:1 mitigation ratio for impacted foraging habitat for all raptors, which includes Swainson's hawk. These mitigation lands can be bundled together with DT, MGS, and/or other mitigation lands.

March 25, 2009

The following provides a description of a discussion between Nick Ricono (AMEC), Kim McCormick (Law Offices of Kim McCormick) and Aaron Allen (Chief Regulatory – North Coast Branch, U.S. Army Corps of Engineers-Los Angeles District).

Aaron Allen
U.S. Army Corps of Engineers-Los Angeles District
805-585-2148

Topic: The jurisdictional status of Lake Palmdale and Palmdale Ditch in the vicinity of Palmdale, CA.

Discussion: Aaron Allen stated that an Approved Jurisdictional Determination (JD) has been made on Lake Palmdale and it is considered a water of the United States based on it being a traditionally navigable waterway with links to interstate commerce based on recreational boating activities.

Aaron stated that a JD has also been made on Palmdale Ditch and it is considered a water of the United States based on there being a relatively permanent connection between two jurisdictional waters (Lake Palmdale and Little Rock Reservoir).

A Preliminary JD was provided (via e-mail) for the Palmdale Ditch (dated 10 July 2008) and an Approved JD was provided for Lake Palmdale (dated 29 October 2003).

Aaron also stated that many waters in the project area including Little Rock Wash (below Little Rock Reservoir), Big Rock Creek, Amargosa Creek, and Anaverde Creek have been determined NON-jurisdictional as they are tributaries to isolated, intrastate waters (Rosamond Lake and Buckhorn Lake and others).

AMEC Earth & Environmental, Inc.
9210 Sky Park Court, Suite 200
San Diego, CA 92123
Tel +858-300-4300
Fax +858-300-4301
www.amec.com

20 April 2009

Project No. 6554000247

Ms. Jamie Jackson
California Department of Fish and Game - Region 5
Lake and Streambed Alteration Program
4949 Viewridge Avenue
San Diego, CA 92123

Subject: Palmdale Hybrid Power Project, Palmdale, California

Dear Ms. Jackson:

AMEC Earth & Environmental, Inc. (AMEC) has prepared the enclosed *Preliminary Jurisdictional Determination and Delineation of Waters of the United States and Waters of the State of California* (JD Report) under subcontract to AECOM Environment (AECOM) and on behalf of the City of Palmdale and Inland Energy, Inc. The City and Inland Energy have submitted an Application for Certification (AFC) for the proposed Palmdale Hybrid Power Project (PHPP or Project) to the California Energy Commission (CEC) in August 2008, and the AFC was determined to be Data Adequate on October 8, 2008.

The Project is a 570-megawatt solar thermal electrical generation facility, to be constructed in the City of Palmdale and unincorporated areas of Los Angeles County. The Project includes a 333-acre power plant site, 50-acre construction laydown area, 35.6-mile transmission line, 7.4-mile reclaimed water pipeline, 8.7-mile natural gas supply pipeline and a 1-mile sanitary wastewater pipeline. AECOM retained AMEC to investigate natural resources in the Project area and determine the potential for impact to sensitive resources, including potential jurisdictional waters. AECOM and AMEC have coordinated sensitive species issues with Scott Harris of your office.

The JD Report identifies multiple waters that may be jurisdictional as Waters of the State of California under the State Fish and Game Code. The Project has been designed to avoid these waters as demonstrated in the attached report. Consequently there are no anticipated impacts to Waters of the State.

It is our understanding that the CEC will conduct a joint environmental review process with CDFG, and will incorporate all required terms and conditions that might otherwise be included in a separate Streambed Alteration Agreement (SAA) into the CEC's certification process as part of the streamlined process adopted in furtherance of the Governor's Executive Order S-14-08. However, since this report demonstrates that the project can be constructed without impacting Waters of the State of California, such conditions would not be needed. Accordingly, based on the attached JD Report, AECOM and AMEC respectfully request that the CDFG provide written confirmation that a SAA is not required for this Project. If you need additional information regarding this project, we would be glad to provide it, or schedule a meeting to discuss in depth.

Thank you for your prompt response to this request. Please do not hesitate to contact me at 858-300-4332 or nick.ricono@amec.com if you have any questions or require additional information.

Sincerely,
AMEC Earth & Environmental, Inc.

Nick Ricono
Project Manager

Attachment (JD Report)

cc: Ms. Sara Head, AECOM

AMEC Earth & Environmental, Inc.
9210 Sky Park Court, Suite 200
San Diego, CA 92123
Tel (858) 300-4300
Fax (858) 300-4301
www.amec.com

Amalong, Matt L

From: Kelly Schmoker [KSchmoker@dfg.ca.gov]
Sent: Monday, March 16, 2009 10:16 AM
To: Amalong, Matt L
Cc: Kimberly McCormick; Scott P. Harris; Joy Nishida
Subject: RE: Palmdale Hybrid Power Plant Project (PHPP)

A Few Comments:
1) there is a sensitive Arctostaphylos in your list of plants you surveyed for, however in the plant species list you only have Archtostaphylos listed to genus and not a species. How do you know that this is not the sensitive one you were looking for?

2) Some plants are only listed to the genus level - Eriastrum sp. what species? Gilia sp? Eriogonum, salix, Agave sp?

4) Walking 30 meter transects may be appropriate protocol for Desert Tortoise surveys, but not for plant surveys. The entire site should be surveyed and every plant observed recorded (a floristic survey). There is also no indication of who actually did the botany work and when the site visits were conducted and if sentinel site visits, as required per CNPS guidelines were conducted. And additionally, were the botanical surveys done exclusively looking for plants, or did you combine personnel and do plant surveys while doing your DT or BUOW surveys? How many hours were spent on what days conducting plant surveys? Sorry, I could not find the Table 4 with survey date you refer to in your e-mail.

Kelly

Kelly Schmoker
Staff Environmental Scientist, Botanist
Dept. of Fish and Game
626-792-1680

>>> "Amalong, Matt L" <Matt.Amalong@amec.com> 3/11/2009 3:31 PM >>>

Hi Kelly,

Attachments 1 and 5 attached. Please see Section 4.2 of the BRTR for survey methodology (30-ft transects). Please see Table 4 for survey dates and personnel.

Matt

-----Original Message-----
From: Kelly Schmoker [mailto:KSchmoker@dfg.ca.gov]
Sent: Wednesday, March 11, 2009 3:04 PM
To: Amalong, Matt L
Cc: Scott P. Harris; Joy Nishida
Subject: Re: Palmdale Hybrid Power Plant Project (PHPP)

Hello,
The bio report sent to us appears to be missing the plant list for the site (Attachment 5) and the specifics on the plant survey methodology.
It is really not sufficient to just state CNPS protocol was followed, we need the methodology written out with dates and who conducted the survey (per the CNPS guidelines) and exactly what was done. Please forward this information to me so I can give you more accurate feedback on the completeness of your plant survey efforts.

Thanks,
Kelly

Kelly Schmoker, M.S.
Staff Environmental Scientist

Date	Surveyors[1]	Time	Area/Location Surveyed[2]	Percent Cloud Cover	Wind (mph)	Temp. (˚F)
2008						
Apr 01	MA, SF, NMo, NMu	07:00-16:00	Plant	0-15	0-15	45-70
Apr 02	MA, SF, NMo, NMu	07:00-16:00	Plant	15-90	1-15	52-66
Apr 03	MA, SF, NMo, NMu	07:00-15:00	Plant	0-5	1-10	47-72
Apr 04	MA, SF, NMo, NMu	06:30-12:00	Plant	0-60	0-3	38-76
Apr 07	MA, JB, SF, AH, NMu	07:00-17:00	Plant & Plant Buffer	5-40	2-15	48-70
Apr 08	MA, JB, SF, AH, NMu	07:00-12:00	Plant ZOI	0-50	0-15	54-63
Apr 09	MA, JB, SF, AH	07:00-16:00	Water ROW, Buffer, & ZOI	0-20	5-20	47-68
Apr 10	MA, JB, SF, AH	09:00-16:00	Water ROW, Buffer, & ZOI	0	0-5	65-79
Apr 11	MA, JB, SF, AH	07:00-12:00	Gas ROW, Buffer, & ZOI	0	0-10	46-72
Apr 14	MA, JB, SF, AH, NMu	07:00-17:00	T-Line ROW, Buffer, & ZOI	0	0-20	60-88
Apr 15	MA, JB, SF, AH, NMu	07:00-16:00	T-Line ROW, Buffer, & ZOI	0-10	5-22	46-68
Apr 16	JB, SF, AH, NMu	07:30-16:00	T-Line ROW, Buffer, & ZOI	0	0-8	45-75
Apr 17	MA, JB, SF, AH, NMu	07:00-16:30	T-Line ROW, Buffer, & ZOI	0	0-12	48-80
Apr 18	MA, JB, SF, AH, NMu	07:30-14:00	T-Line ROW, Buffer, & ZOI	0-40	0-10	64-86
Apr 21	MA, JB, AH, NMu, HR, DS	08:30-15:00	T-Line Buffer & ZOI	0	0-8	58-82
Apr 22	MA, JB, AH, NMu, HR, DS	08:00-17:00	T-Line ROW & Buffer	0	1-18	58-79
Apr 23	MA, JB, AH, NMu, HR, DS	07:30-15:00	T-Line ROW	0-5	1-25	52-62
Apr 24	JB, AH, NMu, HR, DS	07:00-16:00	T-Line ROW, Buffer, & ZOI	0	1-15	45-76
Apr 25	MA, JB, AH, NMu, HR, DS	07:30-17:00	T-Line ROW, Buffer, & ZOI	0	0-8	60-85
Apr 26	JB, AH	06:45-15:00	T-Line Buffer	0	0-5	55-85
2009						
Apr 06	MA, ZK, TR	07:00-15:00	T-Line re-alignments	0	0-10	45-70
Apr 07	MA, JB, SF, ZK, TR, BS	07:00-13:00	T-Line re-alignments	0	0-15	50-70

1 Surveyor Initials:

1 Surveyor Initials:	MA	=	Matt Amalong, Wildlife Biologist, AMEC
	JB	=	Jim Boone, Botanist/Ecologist, Desert Wildlife Consultants, LLC
	SF	=	Steve Ferrand, Wildlife Biologist, Nevada Biological Consulting, LLC
	AH	=	Alex Heindl, Herpetologist, Desert Walkabouts, Inc.
	ZK	=	Zsolt Kahancza, Wildlife Biologist, AMEC
	NMo	=	Nathan Moorhatch, Wildlife Biologist, AMEC
	NMu	=	Nathan Mudry, Wildlife Biologist, eGIS Services, LLC
	TR	=	Ted Rado, Wildlife Biologist, Ted Rado Biological Consulting
	HR	=	Heather Rothbard, Botanist, AMEC
	BS	=	Barrett Scurlock, Wildlife Biologist, Nevada Biological Consulting, LLC
	DS	=	Dennis Strong, Herpetologist, Nevada Biological Consulting, LLC
2 Area/Location:	Plant	=	Power Plant Site
	T-Line	=	Transmission Line
	Water	=	Reclaimed Water Pipeline
	Gas	=	Natural Gas Supply Pipeline
	ROW	=	Right-of-Way
	Buffer	=	100, 200, 300, 400, & 500-foot Transects
	ZOI	=	1,200, 2,400, 3,960 (Power Plant Site), & 5,280 (Power Plant Site) Zone of Influence Transects

Biological Resources

Attachment DR-136

Updated Plant Species List

ATTACHMENT 5

Vascular Plants Observed on the Palmdale Hybrid Power Plant Project Sites
Los Angeles County, California

This list reports only the plants observed on this site by this study. Other species may have been overlooked or undetectable due to their growing season. Plants were identified from keys, descriptions and drawings in Hickman (ed.) 1993. Some specimens were identified or confirmed by Andrew C. Sanders (University of California Riverside Herbarium). Unless noted otherwise, nomenclature and systematics follow Hickman (ed.) 1993.

SYMBOLS AND ABBREVIATIONS:

* Non-native (introduced) species
** Special-Status species (see text).
cf. Uncertain identification, but plant specimen "compares favorably" to named species
sp. Identified only to genus; species unknown (plural = spp.)

GYMNOSPERMS	
Cupressaceae	**Cypress Family**
Cupressus sp.	Cypress
Juniperus californica	California Juniper
Ephedraceae	**Ephedra Family**
Ephedra nevadensis	Nevada joint fir
DICOTS	
Apiaceae	**Carrot Family**
Lomatium mohavense	Mojave Lomatium
Asclepiadaceae	**Milkweed Family**
Asclepias vestita	Woolly Milkweed
Asteraceae	**Sunflower Family**
Ambrosia acanthicarpa	Annual Bursage
Ambrosia dumosa	White Bursage
Amphipappus fremontii	Chaff-bush
Anisocoma acaulis	Scale Bud
Artemisia tridentata	Big Sagebrush
Baccharis salicifolia	Mule Fat
Chaenactis fremontii	Desert Pincushion
Chrysothamnus nauseosus	Rubber Rabbitbrush
Coreopsis bigelovii	Bigelow's Tickseed
Encelia actoni	Acton Encelia
Ericameria cooperi	Cooper's Goldenbush
Ericameria linearifolia	Interior Goldenbush
Eriophyllum ambiguum	Beautiful Woolly Sunflower

Eriophyllum pringlei	Pringle's Woolly Sunflower
Eriophyllum wallacei	Wallace's Woolly Sunflower
Filago depressa	Dwarf Cottonrose
Gutierrezia sp.	Snakeweed, Matchweed
Hymenoclea salsola	Cheesebush
Lasthenia californica	California Goldfields
Layia glandulosa	White Layia
Layia platyglossa	Tidy-tips
Lessingia sp.	Lessingia
Malacothrix glabrata	Desert Dandelion
Nicolletia occidentalis	Mojave Hole-in-the-sand Plant
Psilostrophe cooperi	Paper-daisy
Rafinesquia neomexicana	Desert Chicory
Stephanomeria exigua	Small Wire-lettuce
Syntrichopappus fremontii	Fremont's Syntrichopappus
Tetradymia axillaris var. *longispina*	Longspine Cotton-thorn
Tetradymia glabrata	Littleleaf Cotton-thorn
Xylorhiza tortifolia var. *tortifolia*	Mojave-aster
Boraginaceae	**Borage Family**
Amsinckia menziesii var. *menziesii*	Rancher's Fireweed
Amsinckia tessellata	Devil's Lettuce
Cryptantha cf. *barbigera*	Bearded Cryptantha
Cryptantha circumscissa	Cushion Cryptantha
Cryptantha dumetorum	Bushloving Cryptantha
Cryptantha micrantha	Purple-root Cryptantha
Cryptantha sp.	Cryptantha
Pectocarya penicillata	Sleeping Combseed
Pectocarya recurvata	Curvenut Combseed
Pectocarya setosa	Moth Combseed
Plagiobothrys arizonicus	Arizona Popcornflower
Tiquilia plicata	Fanleaf Crinklemat
Brassicaceae	**Mustard Family**
**Brassica tournefortii*	Sahara Mustard
Descurainia pinnata	Western Tansy Mustard
Guillenia lasiophylla	California Mustard
**Hirschfeldia incana*	Shortpod Mustard
Lepidium flavum	Yellow Peppergrass
Lepidium fremontii	Desert Peppergrass
**Sisymbrium orientale*	Indian Hedge Mustard
Stanleya pinnata	Prince's Plume
Tropidocarpum gracile	Dobie Pod
Cactaceae	**Cactus Family**
Cylindropuntia echinocarpa	Golden Cholla
Opuntia basilaris	Beavertail Cactus
Caprifoliaceae	**Honeysuckle Family**
Sambucus mexicana	Blue Elderberry

Chenopodiaceae	**Goosefoot Family**
Atriplex canescens	Four-winged Saltbush
Atriplex phyllostegia	Arrowscale
Atriplex polycarpa	Allscale
Grayia spinosa	Spiny Hop-sage
Krascheninnikovia lanata	Winter Fat
**Salsola tragus*	Russian Thistle
Crassulaceae	**Stonecrop Family**
Dudleya saxosa	Panamint Liveforever
Cucurbitaceae	**Gourd Family**
Brandegea bigelovii	Desert Starvine
Cuscutaceae	**Dodder Family**
Cuscuta sp.	Dodder
Euphorbiaceae	**Spurge Family**
Chamaesyce albomarginata	Rattlesnake Weed
Croton californicus	California Croton
Stillingia paucidentata	Mojave Toothleaf
Fabaceae	**Legume Family**
Astragalus layneae	Layne's Milkvetch
Astragalus lentiginosus	Freckled Milkvetch
Lupinus concinnus	Bajada Lupine
Lupinus odoratus	Mojave Lupine
Senna armata	Spiny Senna
Trifolium albopurpureum	Rancheria Clover
Fagaceae	**Oak Family**
Quercus john-tuckeri	Tucker's Oak
Geraniaceae	**Geranium Family**
**Erodium cicutarium*	Red-stemmed Filaree
Hydrophyllaceae	**Waterleaf Family**
Emmenanthe penduliflora	Whispering Bells
Eriodictyon trichocalyx var. *trichocalyx*	Yerba Santa
Nama demissum	Purple Mat
Phacelia crenulata	Notch-leaved Phacelia
Phacelia distans	Wild Heliotrope
Phacelia fremontii	Fremont's Phacelia
Lamiaceae	**Mint Family**
Monardella exilis	Mojave Monardella
Salazaria mexicana	Bladder Sage
Salvia carduacea	Thistle Sage
Salvia columbariae	Chia

Salvia dorrii	Purple Sage
Loasaceae	**Loasa Family**
Mentzelia albicaulis	White Stemmed Blazing Star
Malvaceae	**Mallow Family**
Eremalche exilis	White Mallow
Sphaeralcea ambigua	Apricot Mallow
Nyctaginaceae	**Four O'Clock Family**
Abronia pogonantha	Mojave Sand Verbena
Abronia villosa	Desert Sand Verbena
Allionia incarnata	Windmills
Mirabilis bigelovii (*laevis*)	Desert Wishbone Bush
Oleaceae	**Olive Family**
Fraxinus velutina	Velvet Ash
*Olea europaea	Olive Tree
Onagraceae	**Evening Primrose Family**
Camissonia boothii	Booth's Evening Primrose
Camissonia campestris	Mojave Sun Cup
Camissonia claviformis	Brown-eyed Primrose
Camissonia pallida	Paleyellow Sun Cup
Camissonia palmeri	Palmer Evening Primrose
Oenothera californica	California Evening Primrose
Oenothera deltoides	Devil's Lantern
Papaveraceae	**Poppy Family**
Eschscholzia californica	California Poppy
Eschscholzia minutiflora	Pygmy Poppy
Platystemon californicus	Cream Cups
Polemoniaceae	**Phlox Family**
Eriastrum densifolium	Giant Woollystar
Eriastrum sp.	Eriastrum
Gilia latiflora	Broad-flowered Gilia
Gilia sp.	Gilia
Linanthus aureus	Golden Desert-trumpets
Linanthus parryae	Parry's Linanthus
Loeseliastrum matthewsii	Desert Calico
Polygonaceae	**Buckwheat Family**
Centrostegia thurberi	Thurber's Spineflower
Chorizanthe brevicornu	Brittle Spineflower
Chorizanthe rigida	Spiny-herb
Eriogonum fasciculatum	California Buckwheat
Eriogonum inflatum	Desert Trumpet
Eriogonum cf. *maculatum*	Spotted Buckwheat
Eriogonum palmerianum	Palmer's Buckwheat

Eriogonum plumatella	Flat-topped Buckwheat
Eriogonum sp.	Buckwheat
Eriogonum cf. *viridescens*	Two-tooth Buckwheat
Oxytheca perfoliata	Roundleaf Puncturebract
Rumex hymenosepalus	Wild-rhubarb
Portulacaceae	**Purslane Family**
Calandrinia ciliata	Red Maids
Calyptridium monandrum	Sand Cress
Claytonia perfoliata	Miner's Lettuce
Rosaceae	**Rose Family**
Purshia stansburiana	Stansbury Cliffrose
Salicaceae	**Willow Family**
Populus fremontii	Fremont Cottonwood
Salix sp.	Willow
Scrophulariaceae	**Figwort Family**
Castilleja angustifolia	Desert Indian Paintbrush
Castilleja exserta	Purple Owl's-clover
Collinsia bartsiifolia	Chinese Houses
Mimulus bigelovii	Bigelow's Monkeyflower
Penstemon utahensis	Utah Penstemon
Solanaceae	**Nightshade Family**
Datura wrightii	Jimson Weed
Lycium andersonii	Anderson Box Thorn
Lycium cooperi	Cooper's Box Thorn
Tamaricaceae	**Tamarisk Family**
**Tamarix ramosissima*	Salt Cedar
Zygophyllaceae	**Caltrop Family**
Larrea tridentata	Creosote Bush
MONOCOTS	
Liliaceae	**Lily Family**
Agave sp.	Agave
Allium fimbriatum	Fringed Onion
Calochortus kennedyi	Desert Mariposa Lily
Dichelostemma capitatum	Blue Dicks
Muilla coronata	Crowned Muilla
Yucca brevifolia	Joshua Tree
Yucca schidigera	Mohave Yucca
Yucca whipplei	Our Lord's Candle
Zigadenus brevibracteatus	Desert Death Camas
Poaceae	**Grass Family**
Achnatherum hymenoides	Indian Ricegrass

Achnatherum speciosum	Desert Needlegrass
**Bromus madritensis* ssp. *rubens*	Red Brome
**Bromus tectorum*	Cheat Grass
Distichlis spicata	Saltgrass
**Hordeum murinum* ssp. *leporinum*	Hare Barley
**Schismus barbatus*	Mediterranean Grass
Vulpia octoflora	Six Weeks Fescue

Data Request 115:

a. An alternative site located east or south of U.S. Air Force Plant 42 would require a transmission interconnection that would satisfy the City of Palmdale's goal of supporting future residential and commercial development in the eastern corridor of Palmdale. Therefore, staff needs to know whether there are other alternative site(s) located east or south of Plant 42 that would reduce the potential impacts of building the power plant and associated linear facilities at the proposed site.

b. Please address whether any alternative site(s) are identified in a. above would be preferred to the suggested site at 110th East St. between E. Avenue O and E. Avenue P.

Response:

a. The Applicant evaluated two alternate plant sites in both the eastern and southern sections of the City and ruled them out for reasons stated in the PHPP AFC (i.e., they were inferior to the proposed PHPP site for various technical and environmental reasons). The suggested site at 110th East Street between East Avenue O and East Avenue P was also ruled out for reasons given in the PHPP Supplemental Response dated February 13, 2009. The Applicant investigated but did not identify any additional sites located east or south of U.S. Air Force Plant 42 that would reduce any significant impacts associated with the PHPP and associated linear facilities at the proposed site. The reasons for selecting the proposed PHPP site are provided in the PHPP AFC.

b. The Applicant investigated but did not identify any alternative sites that are preferable to either the proposed or alternative sites, and that also are large enough and could be purchased from one or a small number of current owners, as was the case for the proposed site.

Data Request 116:

Please explain the parties involved, permitting, planning/engineering, construction and operation process regarding the transfer of ownership to SCE for Segments 1 & 2 of the 230 kV transmission line.

Response:

The ultimate ownership of the PHPP transmission line is unknown. Ownership of the transmission line could stay with the PHPP owner, be sold to a third party Operations and Maintenance (O&M) firm, or be sold to a local utility such as Southern California Edison (SCE). At this time, the owner of PHPP will not transfer ownership of transmission line Segment 1 and the PHPP portion of line Segment 2 to SCE (Note: line Segment 2 will have two circuits associated with it, one will be the SCE-owned California Department of Water Resources [CDWR] 230-kilovolt (kV) one-way feed and the second will be the PHPP transmission line). The PHPP plant owner will contract with either SCE or another private transmission contractor to engineer, procure, and construct the privately owned “Gentie” 230-kV line. The plant owner will then hire either SCE or another private operation and maintenance contractor to provide O&M support for the life of the transmission line. SCE will own, operate and maintain the CDWR-shared portion of Segment 2 located in SCE’s existing right-of-way (ROW) between the Pearblossom pumping station and the Vincent Substation.

Data Request 117:

> State when the transfer of ownership will occur.

Response:

Please see response to Data Request 116; ownership transfer to SCE is uncertain at this time.

Data Request 118:

> Address whether the California Public Utilities Commission (CPUC) would become involved in the transmission line siting and permitting process, and if so, the timing of the CPUC’s process.

Response:

The siting process for the transmission line proposed for PHPP will follow the regular permitting process with the California Energy Commission, which has jurisdiction over the transmission line to the point of interconnection with the existing grid. If PHPP receives a certification from the Energy Commission, PHPP will work with Southern California Edison as appropriate to obtain any additional approvals that may be needed from the California Public Utilities Commission (CPUC) for the transmission line.

Data Request 119:

> Assuming that the line will eventually be operated by SCE, how will the cost of construction of the transmission line be funded?

Response:

The cost of constructing both line segments will be the responsibility of the PHPP owner.

Data Request 120:

> Given that undergrounding a 230 kV transmission line is a feasible technology, please provide evidence that the owner/operator of the transmission line, presumably SCE, would not accept an underground transmission line into its transmission system, including the rationale for this decision.

Response:

The fact that other applicants have proposed undergrounding transmission lines does not make it a "given" that undergrounding is a "feasible" option as defined by the California Environmental Quality Act (CEQA). The Applicant does not consider it to be a viable alternative for PHPP because 1) undergrounding is significantly more expensive; 2) the ROW would be difficult to acquire in a reasonable period of time; and 3) there are maintenance and safety concerns. In addition, it is not clear that undergrounding would reduce environmental impacts beyond those of the transmission line option already proposed. Even assuming undergrounding may be feasible from a technological standpoint, it is not necessarily feasible for the PHPP as defined under CEQA. In order to be feasible under CEQA, an alternative must not only be technologically feasible, but also must be "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." (14 Code of California Regulations [CCR] 15364.)

As a public agency, the City needs to ensure its Project employs the most cost effective means of interconnection that does not have significant environmental impacts. Even assuming the technology exists to underground the 230-kV line, the use of this technology is extremely expensive and is limited in scope. It is extremely expensive to install (SCE estimates the cost of undergrounding a 230-kV transmission line at approximately $100 million per mile compared to only $5 million to $10 million per mile for aboveground lines), maintain, and repair underground lines. Given the amount of undergrounding required at PHPP, this would require an investment of over $600 million.

In addition, the cable is oil filled, and the oil needs to be circulated to keep the cable cool. The major problems with undergrounding a 230-kV transmission line include the potential for overheating and the ongoing maintenance costs. Underground cable is susceptible to accidental/natural damage by others such as dig-in or earthquake and has the potential to cause environmental damage due to the uncontrolled release of cable oil. SCE told the Applicant that they would never consider undergrounding the lines, as they are too expensive, unreliable, create safety concerns especially in earthquake zones, and increase maintenance problems. Underground transmission and distribution is more cost effective in cold areas like the mid-west because of the possibility of the lines being downed during frequent seasonal ice storms. These storms occur annually and create recurring havoc on transmission and distribution systems. Cost mitigation can be addressed by undergrounding these cold weather utilities.

Another feasibility concern that must be considered is whether the Applicant can reasonably acquire, control, or otherwise gain access to the alternative ROW for an undergrounding option. (*Id.* at § 15126.6(f)(1)). In the area in question (i.e., west of the PHPP plant site along Sierra Highway), there are many owners of the property along the route and a wide transmission corridor for such a technically complex system would be extremely difficult, time-consuming, and expensive to acquire.

Also, a key question in considering the feasibility of an alternative is whether significant effects of the Project (if any) could be avoided or substantially lessened by using that alternate (14 CCR § 15126.6(f)(2)(A)). In this case, undergrounding along Sierra Highway is not necessary to reduce any significant environmental impacts associated with PHPP.

The Applicant has obtained specific email documentation from the new SCE (PHPP) Project Manager, Mr. Drew Brabb, that SCE is not interested in owning nor operating an underground 230-kV transmission line. A copy of an email from Mr. Brabb confirming these discussions is included as Attachment DR-120.

Data Request 121:

> Please provide a list of the specific existing underground utilities located in Sierra Highway, including the type of utility, its owner, and the diameter of any pipeline(s), as well as any other identified constraints associated with undergrounding a transmission line in or alongside Sierra Highway.

Response:

The following specific underground utilities are currently located along the Sierra Highway ROW. Besides SCE's policy and technical constraints (mentioned in Data Request 120) associated with undergrounding its transmission lines, the major external constraint associated with undergrounding along Sierra Highway is that the existing ROW is already crowded with existing utilities, and there may not be enough room to accommodate the underground transmission lines. Other constraints were discussed in the response to Data Request 120, above.

Type of Utility	Owner of Utility	Pipeline Diameter
Distribution Lines	SCE	12-kV above ground
Water Main	LADWP	12 inch
Sewer Line	LADWP	10 inch
Gas Line	SCG&E	10 inch

C.A.T.V.	Time Warner Communication	3-inch cable bundle
Telephone Line	VERIZON	3-inch cable bundle
Railroad	Union Pacific	ROW 50 feet

Data Request 122:

What is the width of the right-of-way of Sierra Highway?

Response:

The Sierra Highway ROW varies from 120 feet to 160 feet in width.

Data Request 123:

Given the potential utility constraints, are there any other roadways parallel to Sierra Highway that you would recommend for underground installation of the 230 kV transmission line?

Response:

There is no other roadway that parallels Sierra Highway for the entire length that is a viable option for underground installation of the 230-kV transmission line because of the constraints identified in Data Responses 120 and 121, above.

Data Request 124:

Please provide the width of the existing SCE right-of-way, and the number of and voltage(s) of the existing lines along 10th Street West.

Response:

The existing transmission line ROW referred to in Data Request 124 is owned by the City of Palmdale. SCE has an electrical easement from the City allowing them to construct the temporary wood pole line on City property. The width of the easement is a standard 15-foot behind curb face (bcf). The pole line consists of one 66-kV three-wire circuit (top level), one 12-kV four-wire circuit (mid level), and two multi-circuit phone cables (bottom level). The minimum ROW for a 230-kV transmission line is 60 feet, which would allow for the 38 foot width of the double circuit steel pole and a 10-foot freeboard on either side for maintenance access. Therefore, the existing 15-foot bcf easement would not be sufficient for a 230-kV line.

Data Request 125:

Are there any other substations besides Vincent 500/230 kV Substation that could be used for interconnection with the PHPP project?

Response:

The Antelope Substation was an option at the initial stages of development; however, SCE recommended the Vincent interconnection over the Antelope interconnection because of operating constraints associated with planned expansion of the regional grid. According to page 5 of the PHPP System Impact Study (SIS), SCE acknowledged the primary point of interconnection for the PHPP and delivery to the California Independent System Operator (CAISO) is at the Vincent Substation.

It should be noted that the Applicant is not in a position to select nor influence the interconnection point with the grid. The interconnection point is selected by the CAISO and is reported in the SIS. The Applicant has the obligation to connect where directed to do so by the CAISO.

We have provided Attachment DR-125 at the end of this section which includes an email from the current SCE Project Manager, Mr. Paul Sindelar, attesting to the fact that there have been ongoing communications between SCE and PHPP regarding interconnection options as part of the System Impact Study.

Data Request 126:

If so, please detail what additional transmission line upgrades would be necessary and whether the upgraded line(s) would still need to connect to Vincent Substation. If Vincent Substation is the only feasible interconnection, please provide evidence supporting this statement.

Response:

According to page 5 of the SIS, which was submitted as part of the PHPP AFC (Appendix F), SCE acknowledges that the primary point of interconnection for the PHPP and delivery to the CAISO is at the Vincent Substation. However, SCE has not studied any other points of interconnection since the Project requested interconnection at Vincent Substation.

Alternatives

Attachment DR-120

Email from Mr. Drew Brabb, SCE Project Manager

Subject: FW: 230 kV Underground Option for Palmdale Project

From: Drew.Brabb@sce.com [mailto:Drew.Brabb@sce.com]
Sent: Wednesday, April 29, 2009 7:56 AM
To: Tony Penna
Cc: Allen Cadreau; Tony Penna; Paul.Sindelar@sce.com
Subject: 230 kV Underground Option for Palmdale Project

Gentlemen

As discussed in several meetings with you, and most recently at our April 14th and April 28th meetings, SCE is not interested in owning or operating an underground 230kv circuit.
The primary reasons for not desiring underground high voltage circuits include high maintenance cost, seismic concerns, technical challenges, and safety concerns. Our focus is and has been on constructing and maintaining above-ground facilities.

I hope this answers all of your questions and closes our discussion on this topic.

Drew Brabb
Project Manager
Transmission/Distribution Grid Contracts
626-302-2498

Alternatives

Attachment DR-125

Email from Paul Sindelar, SCE Project Manager

Subject: FW: Palmdale Hybrid Power Project (PHPP) Meeting - CEC Data Request

From: Paul.Sindelar@sce.com [mailto:Paul.Sindelar@sce.com]
Sent: Tuesday, April 28, 2009 4:12 PM
To: Tony Penna
Cc: Allen Cadreau; 'Brian O'Leary Bennett'; drew.brabb@sce.com; Roy Xu; Tom Barnett; Tony Penna
Subject: Re: Palmdale Hybrid Power Project (PHPP) Meeting - CEC Data Request

Tony,

Attached is Edison's input to the CEC questions. While these have not been 100% reviewed internally, I believe they provide the information you need.

As we discussed, the Palmdale Power Project Facilities study is one of many serial projects that need to be completed. In this regard, the Project is located in the Tehachapi Corridor and the upgrades required in that area are being studied for all the projects at one time. We are following up to determine when Edison expects to have the study complete and will provide you an update.

Please let me know if you have any questions.

Paul Sindelar
PAX 29417
Phone: (626) 302-9417
Internal Mail Location:
Grid Interconnection Contracts
Quad 4C, G.O. 1

Tony Penna <tonypenna@inlandenergy.com> 04/28/2009 11:06 AM

To "'Paul.Sindelar@sce.com'" <Paul.Sindelar@sce.com>

cc "drew.brabb@sce.com" <drew.brabb@sce.com>, Allen Cadreau <allencadreau@inlandenergy.com>, Tony Penna <tonypenna@inlandenergy.com>, 'Brian O'Leary Bennett' <brian.bennett@me.com>, Tom Barnett <tbarnett@inlandenergy.com>, Roy Xu <royxu@inlandenergy.com>

Subject Palmdale Hybrid Power Project (PHPP) Meeting - CEC Data Request

Data Request 91:

Please provide a revised NO_2 construction modeling analysis using an area source (or multiple sources) that is more representative of proposed site preparation of the solar field (area sources SOLARC and SOLARF). The use of the AERMOD PVMRM modeling option might be useful in addressing near field NO_2 concentrations.

Response:

The construction modeling presented in the PHPP AFC was performed as specified in the Class II Modeling Protocol, submitted on July 30, 2008 (AFC Appendix G.4). No comments have been received by the Applicant regarding the proposed modeling procedures in that document. The construction modeling proposed in the protocol is similar to the modeling completed for the Victorville 2 Hybrid Power Project (07-AFC-1) and accepted by both the CEC and MDAQMD without comment.

As described in Section 2.3.4 of the modeling protocol, two area sources were selected to represent construction activities in the power block area and another area source for solar field construction. The size of the area source was selected to reflect the largest area that would be disturbed in any given day. Because of the prevailing winds, the location of the solar field construction modeling source was placed to the west of the power block source in order to maximize the interaction between the two sources.

Nonetheless, additional modeling for respirable particulate matter (PM10) and nitrogen dioxide (NO_2) was performed to explore other possible locations of the solar field area sources. The sources were modeled at four possible locations:

- Center of the Project site to the west of the power block sources as described in the modeling protocol.
- Along the western fence line of the Project site.
- In the extreme northeast corner of the Project site.
- In the extreme southeast corner of the Project site.

Additionally, as discussed in the response to Data Request 94, the emissions have been modified to reflect the following mitigation measures and additional information that has become available since the AFC was submitted:

- A silt content of 11 percent was assumed for the ground being graded to better represent the characteristics of the unpaved surfaces at the Project site.
- The watering trucks will have forward mounted sprayers, eliminating their fugitive emissions.

Table DR-91a shows the updated PM10 and NO_2 emissions used for construction modeling.

Table DR-91a. Updated PM10 and NOx Construction Emissions

Pollutant	Source	Averaging Period	Power Block Emission Rate (lb/hr)	Solar Field Emission Rate (lb/hr)
NOx	Construction Equipment	1-hr	22.1	19.6
	On-site Motor Vehicles	1-hr	0.4	0.3
	Construction Equipment	Annual	6.7	7.8
	On-site Motor Vehicles	Annual	0.1	0.1
PM10	Construction Equipment	24-hr	0.8	0.6
	On-site Motor Vehicles	24-hr	0.003	0.001
	Fugitive Emissions	24-hr	5.6	4.7
	Construction Equipment	Annual	0.5	0.5
	On-site Motor Vehicles	Annual	0.002	0.005
	Fugitive Emissions	Annual	3.8	1.9

A figure showing the location of the four variations of construction source locations is provided with the revised Air Quality Impact Assessment (AQIA) requested in Data Request 114. The worst case results of the four modeled cases occurred when the solar array construction sources were placed along the western fenceline for the 1-hour NO_2 impacts, while the worst case 24-hour an annual PM10 impacts occurred when the solar array construction sources were in the southeast corner of the Project site. The worst case results are presented in Table DR-91b.

Table DR-91b. Updated AERMOD Construction Modeling Impacts

Pollutant	Averaging Period	AERMOD Predicted Concentrations ($\mu g/m^3$)				Background Value (μg/m3)	Max Plus Background ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)
		2002	2003	2004	Max.			
NO_2	1-hour(1)	287.21	308.31	224.69	308.31	139.2	N/A	339
	Annual	11.03	11.74	11.25	11.74	28.2	39.9	57
PM10	24-hour	21.80	36.76	22.77	36.76	86.0	122.8	50
	Annual	4.42	4.60	4.44	4.60	25.0	29.6	20

(1) Results listed in individual years and maximum include modeled impacts plus time matched ambient backgrounds. The use of time matched backgrounds is less conservative than the approach used in the AFC.

As was the case in the modeling presented in the AFC, construction was limited to 10 hours per day (7:00 am to 5:00 pm) from February through the end of October, and 8 hours per days (8:00 am through 4:00 pm) the rest of the year. Table DR-91b shows that while the resulting NO_2 impacts are slightly higher than the AFC results, there is no change in the overall conclusion that the California Ambient Air Quality Standard (CAAQS) will not be exceeded. The maximum NO_2 impact over all of the sources combinations, modeled using the ozone limiting method (OLM), when added to the hourly time-matched background, shows that all hours are below the 1-hour CAAQS for NO_2 of 339 $\mu g/m^3$.

The PVMRM method of determining NO_2 impacts was considered as an alternative to the OLM, but as was demonstrated in the study *Sensitivity Analysis of PVMRM and OLM in AERMOD, MACTEC* (2004) (http://www.epa.gov/scram001/7thconf/aermod/pvmrm_sens.pdf), PVMRM produces more conservative results for area sources than OLM. As a result, it was decided to continue using OLM as was proposed in the Class II Protocol and presented in the original AFC.

The maximum modeled 24-hour PM10 impact for all four of the source location cases exceeds the CAAQS when background concentrations are added, because the PM10 air quality monitoring station data show that the CAAQS are already exceeded in this area. The same is true for annual PM10, as the Project impacts represent only 16 percent of the total impact to the annual PM10 concentrations, but the background value already exceeds the CAAQS. The same meteorological conditions leading to high early morning and evening NO_2 concentrations will also produce high PM10 concentrations. Thus, the NO_2 mitigation strategy of limiting hours of most of the construction activities during the winter in order to reduce the NO_2 concentrations also has a positive impact on reducing modeled particulate concentrations.

Data Request 92:

> Please provide a NO_2 construction emission mitigation proposal that will reduce potential impacts and avoid a violation of the State NO_2 standard. Emission mitigation should include such measures as limiting construction equipment to CARB (California Air Resources Board) Tier 2 or Tier 3 engines, which would significantly reduce NOx emissions from the OFFROAD2007 fleet average emissions used in the construction emission inventory.

Response:

As described in AFC Appendix G.3, page 2-1, the engines in the large scrapers used to grade the solar array site will be equipped with model year 2006 or later engines, which will be required to meet California Tier 3 emission standards. The resulting emissions from these engines were included in the emissions used for the modeling presented in the AFC and in Data Response 91. The results presented in Data Response 91 demonstrate that emissions during construction will not cause the NO_2 CAAQSs to be exceeded. Other construction equipment will be equipped with Tier 3 compliant engines if available and feasible.

Data Request 93:

Please provide a revised PM10 construction modeling analysis using an area source (or multiple sources) that is more representative of the proposed site preparation of the solar field (area sources SOLARC and SOLARF).

Response:

See the response to Data Request 91.

Data Request 94:

Please provide a PM10 construction emission mitigation proposal that will reduce potential impacts and minimize a violation of the State PM10 standard. Emission mitigation should include such measures as limiting construction equipment to CARB Tier 2 or Tier 3 engines, which would reduce PM10 emissions from the OFFROAD2007 fleet average emissions used in the construction emission inventory. In addition CARB Level 3 diesel particulate matter (DPM) catalysts should be considered, which would reduce combustion PM10 emissions by more than 85 percent.

Response:

The AFC proposed Mitigation Measures AQ-SC3 and AQ-SC4 to reduce potential fugitive PM10 emissions during construction and Mitigation Measure AQ-SC5 to reduce potential emissions from construction equipment exhaust. Additional reductions from the emissions presented in the AFC will be achieved by equipping the water trucks used during site preparation with front spray bars to moisten the soil in front of the trucks. Since the trucks will be traveling on freshly moistened surfaces, they will not generate fugitive PM emissions. The reduced fugitive PM emissions achieved by this modification have been incorporated in the modeling presented in Data Response 91.

The soil silt content used to calculate fugitive PM emissions during construction has been increased from 7.5 percent to the conservative default value of 11 percent recommended by the Mojave Desert Air Quality Management District (AQMD) and the Antelope Valley AQMD (Mojave Desert AQMD and Antelope Valley AQMD Emissions Inventory Guidance, Mineral Handling and Processing Industries April 10, 2000 page 26). Revised fugitive PM emissions resulting from this revision have been incorporated in the modeling presented in Data Response 93.

Revised combined-cycle facility and solar array construction PM10 and PM2.5 emissions are summarized in Table DR-94, and detailed calculations are in Attachment DR-94 at the end of this section.

Table DR-94. Revised Combined-Cycle and Solar Array Particulate Matter Construction Emissions Summary

Project Component	PM10 (lb/day)	PM10 (tpy)	PM2.5 (lb/day)	PM2.5 (tpy)
Combined-Cycle Facility, On Site	63.6	7.9	18.6	2.3
Combined-Cycle Facility, Off Site	19.0	2.2	5.3	0.6
Solar Array, On Site	52.9	4.3	15.1	1.5
Solar Array Off Site	28.1	2.3	8.7	0.9
Lb/day = pounds per day; tpy = tons per year				

PM10 emissions from construction equipment exhaust are a small fraction of peak daily on-site PM10 emissions during construction. For example, estimated construction equipment exhaust PM10 emissions only contribute 5.7 lb/day of the on-site peak daily total of 52.9 lb/day during solar array construction. Thus, imposing additional mitigation measures to reduce PM10 emissions from construction equipment exhaust would only have a small benefit. However, the Applicant will consider making a good-faith effort to find and use diesel construction equipment with engines of 100 hp or above that meet California Tier 3 standards for off-road engines and to find and use equipment with engines of 50 to 100 hp that meet California Tier 2 emission standards.

Data Request 95:

> Please verify that all project-related emission sources, including the solar array operating and maintenance non-stationary emissions sources (including vehicle use, mirror washing, maintenance inspections and repairs of the piping network, herbicide application and dust suppressant application) have been included in the Class I, Class II and visibility modeling analyses. All relevant sources should be included in the modeling for commissioning, normal operations and startup/shutdown scenarios. These emissions are summarized in AFC Section 5.2.4.1 and Table 5.2-27. The Class I modeling does not need to be revisited if EPA does not require the inclusion of the non-stationary solar array operations and maintenance emission sources.

Response:

Similar to the response to Data Request 91, the modeling protocol submitted with the AFC clearly identified (in Section 2.3) that non-stationary maintenance vehicles would not be modeled in support of the AFC and no comments were received on the Class II modeling protocol. Those emissions were not originally included because the emissions were expected to have minor affect on the modeled impacts during operation. This approach was similar for the recently permitted Victorville 2 Hybrid Power Project (07-AFC-1).

Per the CEC request, these emissions have been included in the modeling. They were modeled as an area source covering the entire area to be occupied by the solar field in the modeling for normal operations including Project sources only, for cumulative modeling, and startup / shutdown modeling.

Emissions from solar array maintenance vehicles have been revised. These revisions include corrections to some calculation errors and increasing the unpaved surface silt content from 7.5 percent to the conservative default value of 11 percent recommended by the Mojave Desert AQMD and the Antelope Valley AQMD (Mojave Desert AQMD and Antelope Valley AQMD Emissions Inventory Guidance, Mineral Handling and Processing Industries, April 10, 2000, page 26). Revised calculations are provided in Attachment DR-95 at the end of this section.

The emissions for this source are shown in Table DR-95. Source parameters for these emissions were the same as for the fugitive / vehicular emissions for the construction sources. A release height of 2.0 m was assumed, with an initial plume height of 15 feet (4.57 m). Following EPA guidance (EPA, 2004), the initial area source vertical standard deviation was estimated as the plume depth divided by 2.15, or 2.13 m.

Table DR-95. Motor Vehicle Criteria Pollutant Emissions

Averaging Period	CO	NOx	SOx	Exh. PM10	Fug. PM10	Exh. PM2.5	Fug. PM2.5
1-Hour (lb/hr)	0.045	0.065	0.0007	0.0019	11.0	0.0019	2.3
24-Hour (lb/day)	0.28	0.37	0.0044	0.011	68	0.011	14
Annual (tpy)	0.012	0.0025	0.0001	0.0001	2.9	0.0001	0.61

The updated modeling results for these runs is presented in the revised AQIA, requested in Data Request 114. As can be seen in that response, the addition of the maintenance vehicles had little or no affect on the results presented in the AFC.

Maintenance vehicles and other low level sources were not included in the Class I area modeling. The Class I Area protocol was submitted to EPA and the Federal Land Manager in August 2008, and as of yet no comments have been received from these agencies. However, this approach (inclusion of only the tall stacks) has been acceptable to the EPA and FLMs on many other projects.

Reference:

EPA, 2004. User's Guide for the AMS/EPA Regulatory Model – AERMOD (EPA-454/B-03-001).

Data Request 96:

Please provide revised air quality modeling results for all scenarios and pollutants where the non-stationary solar array operations and maintenance emission sources (including vehicle use, mirror washing, maintenance inspections and repairs of the piping network, herbicide application and dust suppressant application) were excluded in the AFC modeling, as well as all relevant input, output and intermediary files in electronic format. These emissions are summarized in AFC Section 5.2.4.1 and Table 5.2-27.

Response:

Revised Modeling Results are provided in electronic format along with the revised AQIA requested in Data Request 114. As noted above, inclusion of these sources had little affect on the results.

Data Request 97:

a. Please provide GHG emission estimates for construction activities, including all of the GHG emissions from the off-road equipment and on-road vehicles shown in the construction emission tables within Appendix G.3.

b. Please address the significance of the GHG emissions quantified above.

Response:

97a: Greenhouse gas (GHG) emissions during construction of the PHPP have been estimated for the construction equipment and motor vehicle usage shown in the construction emission tables in AFC Appendix G.3. The emission calculation procedures and detailed calculations are provided in Attachment DR-97 at the end of this section. Estimated emissions are summarized in Table DR-97.

97b: Construction of industrial facilities such as power plants requires coordination of a variety of equipment and personnel that results in temporary increases in vehicle and equipment emissions, including GHG emissions. The temporary and relatively minor GHG emissions associated with PHPP construction activities would not be significant for several reasons. First, the period of construction would be temporary, with the emissions intermittent during the period. Additionally, “best practice” control measures that likely will be included as Conditions of Certification to control criteria pollutants during construction – such as limiting idling times and requiring, as appropriate, equipment that meet the latest emissions standards – will further minimize GHG emissions. These measures will likely ensure PHPP’s consistency with future regulations by CARB to reduce GHG emissions during construction.

Table DR-97. PHPP Construction Greenhouse Gas Emissions

Construction Element	Carbon dioxide (CO_2) Equivalent Emissions (MT[a])
Combined Cycle Facility Construction	5,640
Solar Array Construction	6,084
Reclaimed Water Pipeline Construction	1,919
Natural Gas Pipeline Construction	2,591
Sanitary Wastewater Pipeline Construction	303
Potable Water Pipeline Construction	121
Transmission Line Segment 1 Construction	3,014
Transmission Line Segment 2 Construction	944
Total Emissions	**20,616**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Data Request 98:

> Please provide a revised emission offset proposal for the project's NO_x emissions liability. The revised ERC proposal should clearly identify the source of all ERCs and include documentation of all offset ratios, including inter-pollutant and inter-basin ratios.

Response:

To offset the Project's NOx emissions, the City initially intended to obtain offsets from the South Coast AQMD Priority Reserve. Recent court actions, however, have rendered the Priority Reserve offsets currently unavailable. As an alternative offset strategy, the City has identified sufficient quantities of ERCs to satisfy Project demand for NOx within the San Joaquin Valley Air Pollution Control District (SJVAPCD) that are available for purchase. PHPP is downwind of the SJVAPCD, which has been determined to be a source of degraded air quality in the Antelope Valley. The City's negotiations for the SJVAPCD-based ERCs have advanced to a point that the City is confident such ERCs can satisfy PHPP's requirements.

The AVAQMD and SJVAPCD Governing Boards would have to approve by resolution any inter-basin transfer of SJVAPCD-based ERCs pursuant to Health & Safety Code Section 40709.6(d). It is the City's understanding that such an approval could be obtained as necessary.

The City also continues to investigate the availability of NOx ERCs from the TXI/Riverside Cement upgrade project ("TXI"). TXI may potentially result in a large quantity of NOx ERCs becoming available in the Mojave Desert AQMD bank. The certification of the TXI ERCs, however, remains on hold as the Mojave Desert AQMD and EPA resolve several outstanding questions about TXI. Based on our understanding, the Mojave Desert AQMD has provided data about the TXI ERCs to the EPA but it is unclear whether these data satisfy the EPA's concerns. In light of the delayed certification of the TXI ERCs, the City continues to investigate the alternative offset strategy of obtaining SJVAPCD-based ERCs, as discussed above.

Regarding the NOx offset ratio, according to Antelope Valley AQMD Rule 1305(C), NOx ERCs must be offset at a ratio of 1.3:1.

Data Request 99:

> Please provide the analysis supporting the proposed inter-basin/inter-pollutant trading ratios for ERCs from the San Joaquin air basin for each pollutant.

Response:

As discussed in the response to Data Request 98, the City has identified sufficient quantities of NOx ERCs available for sale in the SJVAPCD to satisfy PHPP requirements. The City has similarly identified sufficient quantities of VOC ERCs for sale in the SJVAPCD to satisfy PHPP needs. According to AVAQMD Rule 1305(C), NOx and VOC ERCs must be offset at a ratio of 1.3:1. The Antelope Valley AQMD does not require additional offset ratios for inter-basin transfers. No inter-pollutant ERC transfers are anticipated at this time.

Data Request 100:

> Please provide documentation that the Antelope Valley Air Quality Management District (AVAQMD), SJVAPCD, CARB and US Environmental Protection Agency concur with the revised ERC proposal.

Response:

As demonstrated in Attachment DR-100, provided at the end of this section, the Antelope Valley AQMD staff concurs with the City's ERC strategy discussed in the response to Data Request 98. If SJVAPCD-based ERCs are obtained, the AVAQMD and SJVAPCD Governing Boards would have to approve the inter-basin transfer pursuant to Health & Safety Code Section 40709.6(d). It is the City's understanding that such an approval could be obtained as necessary. In addition, pursuant to Antelope Valley AQMD Rule 1305(B)(5)(a)(i), the Antelope Valley AQMD Air Pollution Control Officer must consult with CARB and the EPA before approving any inter-basin, inter-district transfers, but no formal approval by CARB or the EPA is required.

Data Request 101:

Please provide documentation as to the status of negotiations between the City and TXI Riverside Cement Company in securing NOx ERCs, and if available an option contract between TXI and the City.

Response:

As discussed in the response to Data Request 98, the City continues to investigate the availability of NOx ERCs from TXI. The certification of the TXI ERCs, however, remains on hold as the Mojave Desert AQMD and EPA resolve several outstanding questions about the TXI ERCs. Based on our understanding, the Mojave Desert AQMD has provided data about the TXI ERCs to the EPA but it is unclear whether these data satisfy the EPA's concerns. In light of the delayed certification of the TXI ERCs, the City continues to investigate the alternative offset strategy of obtaining SJVAPCD-based ERCs, as discussed above.

Data Request 102:

Please identify the progress in developing a fugitive dust from paving roads banking rule with the AVAQMD.

Response:

To offset the Project's PM10 emissions, the City intends to generate PM10 ERCs by paving roads in compliance with an expected Antelope Valley AQMD road-paving rule. This rule would be modeled after the Mojave Desert AQMD Rule 1406. Based on our communications with the Antelope Valley AQMD Counsel, the expected road-paving rule will be introduced to the Antelope Valley AQMD Board in the very near future.

Data Request 103:

Please identify the specific roads in the vicinity of the PHPP that would be used to generate the PM10 ERCs.

Response:

At this time, the final selection of roads has not been made. The City of Palmdale has identified 38 unpaved roads in the vicinity of the Project with the potential for generating emission offsets through road paving. Based on road length and vehicle traffic, the 11 dirt road segments shown in Table DR-103 have the highest emissions per mile and consequently would be the most cost effective roads to pave to achieve the necessary emission offsets. Depending on which specific roads are selected, paving approximately five of these 11 roads would be required to generate the necessary emission offsets.

Table DR-103. Potential Road Segments for Generation of PM10 ERC

Street	From	To
Avenue B	90th Street West	30th Street West
Avenue S-2	96th Street East	106th Street East
110th Street East	Avenue L	Columbia Way/Avenue M
40th Street West	Avenue N	Avenue N-8
Avenue Q	90th Street East	110th Street East
Avenue S-6	96th Street East	106th Street East
Barrel Springs Road	Sierra Highway	25th Street East
Avenue T-10	87th Street East	96th Street East
Avenue N-8	Bolz Ranch Road	30th Street West
Avenue G	90th Street East	120th Street East
Carson Mesa Road	El Sastre	Vincent View Road

Data Request 104:

> Please provide all appropriate calculations including vehicle miles traveled via traffic counts and silt content analysis used to quantify the emission reductions that are expected to be generated.

Response:

The approach for estimating the PM10 and PM2.5 emission reductions is based on the methodologies described by the EPA in AP-42, Compilation of Air Pollutant Emission Factors, and rules developed by Maricopa County Air Quality Department (MCAQD) and Mojave Desert AQMD.

Emission Factor Calculation Approach for Unpaved Roads

The emission factor for road dust emissions from unpaved roads dominated by light duty vehicles is estimated using **Equation 1**. The emission factor gives the quantity in pounds (lb) of particulate emissions per Vehicle Miles Traveled (VMT).

$$E.F. = \frac{k(s/12)^a (S/30)^d}{(M/0.5)^c} \qquad \text{(Eq. 1)}$$

Where:

E.F. = size-specific emission factor for unpaved road (lb/VMT)

s = surface material silt content (percent)

M = surface material moisture content (percent)

S = mean vehicle speed (miles per hour)

The empirical constants k, a, c, and d used in **Equation 1** are provided in **Table DR-104a**.

Table DR-104a Constants for Unpaved Public Roads

Constant	PM10	PM2.5
k (lb/VMT)	1.8	0.18
A	1	1
C	0.2	0.2
D	0.5	0.5

Table DR-104b explains the source of the data to be used in the emission factor calculation along with the basis for determining the parameter.

Table DR-104b Unpaved Road Emissions Data Needs

Parameter	Plan for Obtaining Data and Basis
s	Silt content of the unpaved road segments will be determined using the sampling and laboratory analysis procedures provided in EPA's "Compilation of Air Pollutant Emission Factors," (AP-42), Fifth Edition, Volume 1, Appendices C.1 and C.2. For longer roads in spatially diverse study areas, Appendix C.1 recommends that one collect a sample for each three miles length of the road. For this Project, one sample will be collected for each 0.5 mile of unpaved road. Each sample will be analyzed according to ASTM D422 for silt content. The average of silt content for all samples collected on a single road segment will be used in the emission factor calculation.
M	Use default value of 1 percent (ref. Mojave Desert AQMD Rule 1406)
S	Use default value of 20 mph (ref. Mojave Desert AQMD Rule 1406)

Emission Factor Calculation Approach for Paved Roads

The road dust emissions from re-suspension of loose material on the road surface due to vehicle travel on a dry paved road are estimated using **Equation 2**.

$$E.F' = k\left(\frac{sL}{2}\right)^{0.65}\left(\frac{W}{3}\right)^{1.5} \qquad \text{(Eq. 2)}$$

Where:

E.F' = emission factor for paved road (lbs/VMT)

k = particulate size multiplier for particle size range and units of interest; the multiplier varies with aerodynamic size rage. The appropriate value of k is listed in **Table DR-104c.**

sL = road surface silt loading (grams per square meter [g/m^2])

W = average weight (tons) of the vehicles traveling the road

Table DR-104c Particle Size Multipliers for Paved Road (k)

Size Range	lb/VMT
PM10	0.016
PM2.5	0.0024

Table DR-104d shows the default values for other parameters in **Equation 2**.

Table DR-104d. Paved Road Emissions Data Needs

Parameter	Plan for Obtaining Data and Basis
sL	Use default value of 0.23 g/m^2 (ref. Mojave Desert AQMD Rule 1406)
W	Use default value of 3.74 tons (ref. Mojave Desert AQMD Rule 1406)

Emission Reduction Calculations

The activity rate calculation is described below describes the calculation of emission reductions due to paving of an unpaved road. The activity rate of a paved road segment is assumed to be the same as the activity rate before the road segment is paved. The activity rate is calculated using **Equation 3**.

$$A.R. = ADT \times L \quad \text{(Eq. 3)}$$

Where:

A.R. = activity rate (VMT/day)

ADT = average daily traffic (number of vehicles/day)

L = length of the road segment (miles)

The VMT/day and VMT/year calculations for each roadway segment are based on the time-weighted averages of traffic counts for that particular roadway segment.

The data required for estimating the activity rate are shown in **Table DR-104e**.

Table DR-104e Activity Rate Data Needs

Parameter	Plan for Obtaining Data and Basis
ADT	Mojave Desert AQMD Rule 1406 require that two traffic counts be conducted over 48-hour periods, each consisting of two non-consecutive 24-hour periods. For this Project, the ADT will be the average of a five consecutive non-holiday weekdays plus two consecutive non-holiday weekend days.
L	The length of the road segment will be measured using GIS, Google Earth, or equivalent mapping tool.

Emission Reduction Calculation Approach

The PM10 and PM2.5 emission reductions associated with paving a segment of unpaved road are calculated using **Equation 4**. The emissions reduction is calculated as the difference, in tpy, between the emissions from the road in the unpaved condition and the emissions from the road in the paved condition.

$$E.R. = (E.F. - E.F.') \times A.R. \times \frac{365\, days / year}{2000\, lb / ton} \qquad \text{(Eq. 4)}$$

Where:

E.R. = emission reduction (tpy)

E.F. = emission factor for unpaved road (lb/VMT)

E.F.' = emission factor for paved road (lb/VMT)

A.R. = activity rate (VMT/day)

Data Request 105:

Please adjust all calculations quantified in Data Request 14 to quantify the necessary roads to be paved to generate PM2.5 mitigation.

Response:

The proposed Project does not exceed significance thresholds for PM2.5 emissions (i.e., does not cause an exceedance of the applicable ambient air quality standards), thus mitigation for PM2.5 emissions is not required and is not proposed for this Project.

The proposed paving of unpaved roads will, however, generate emission reductions of PM2.5 in the vicinity of the Project at a rate of approximately 10 percent of the PM10 emission reductions based on EPA guidance.

Data Request 106:

Please identify the sources and quantities of VOC ERCs that will be secured within the Antelope Valley AQMD or another air district through an inter-district or inter-basin offset proposal.

Response:

As discussed in the response to Data Request 99, the City has identified sufficient quantities of VOC ERCs for sale in the SJVAPCD to satisfy PHPP demand. The SJVAPCD Governing Board would have to approve by resolution any inter-basin transfer of SJVAPCD-based ERCs pursuant to Health & Safety Code Section 40709.6(d). It is the City's understanding that such an approval could be obtained should it become necessary.

Data Request 107:

> Please identify the sources and quantities of SOx ERCs, or interpollutant ERCs, that will be secured within the AVAQMD or another air district through an inter-district or inter-basin offset proposal.

Response:

As stated in Section 5.2.5.2 of the AFC, Antelope Valley does not require that SO_2 emissions less than 25 tpy be offset. However, it is expected that the CEC will require these emissions to be offset as a precursor to PM10. Because these emissions are being mitigated due to their potential contribution to PM10 in the area, these SO_2 emissions will also be offset using PM10 ERCs from road paving. An offset ratio of one to one (1:1) will be applied, similar to that required by the Mojave Desert AQMD. As discussed in the response to Data Request 103, paving as few as 5 of the 11 candidate road segments identified is expected to provide more than sufficient ERCs to meet PHPP's requirements for these offsets.

Data Request 108:

> Please provide copies of any permit application materials, other than AFC materials, submitted to the AVAQMD and EPA.

Response:

The PHPP Prevention of Significant Deterioration (PSD) permit application along with the PHPP Biological Assessment (BA) were submitted on March 30, 2009 to EPA Region 9. A copy of the PSD application was offered to Mr. Alan DeSalvio of the Antelope Valley AQMD, but he declined. A copy of the PSD was provided to Ms. Felicia Miller at the CEC on April 1, 2009 and four additional electronic copies of the PSD application and BA on compact disk (CD) were provided to her on April 23, 2009. Electronic copies and one hard copy of the PSD application were also sent to the U.S. Forest Service FLM (Messrs. Mike McCorison, Trent Procter, Rick Graw, and Howard Gebhart) and a partial application (excluding figures and appendices) was emailed to Ms. Dee Morse of the National Park Service on April 1, 2009.

Subsequent to submittal of the PSD application to EPA, some answers to questions have been provided to assist EPA with their completeness determination. Copies of these emails are provided in Attachment DR-108 at the end of this section.

Comments on the PHPP Preliminary Determination of Compliance (PDOC) were emailed to the Antelope Valley AQMD (Mr. DeSalvio) on March 19, 2009. Copies of the PDOC comments were emailed to Ms. Felicia Miller at the CEC and Ms. Shirley Rivera of the EPA on March 25, 2009.

Data Request 109:

> Please provide copies of any subsequent submittals to or from the District and/or EPA within 5 days of their submittal to or their receipt from the AVAQMD.

Response:

Please see the response to Data Request 108, above. Copies of the PSD and the PDOC comments were both submitted to Ms. Felicia Miller at the CEC within five (business) days of our correspondence with the Antelope Valley AQMD. Future correspondence will also be provided.

Data Request 110:

> Please confirm in writing what permit applications or permitted future sources, if any, are located within six miles of the PHPP site. This list of sources should also include any projects that have been permitted but are not yet operating.

Response:

On July 2, 2008, ENSR (now AECOM Environment), on behalf of the City of Palmdale, requested an inventory of existing and permitted but not yet constructed sources from the Antelope Valley AQMD for inclusion in a cumulative modeling analysis for the PHPP. ENSR requested a significant impact area (SIA) of 10 kilometers (km), meaning that all sources within the SIA plus 50 km, for a total radius of 60 km from the proposed PHPP site, were eligible to be considered. The following is an excerpt from that request letter:

1) An inventory to assess NAAQS and PSD increment compliance for NO_2 and PM10. Please assume a significant impact area of 10 kilometers extending from the approximate location of the proposed combustion turbine stacks. Therefore, to identify the background sources for the analysis, use a radius of 60 kilometers and the central UTM coordinate relative to the proposed combustion turbine stacks of 398,678 meters East, 3,833,500 meters North, NAD83, Zone 11.

2) An inventory of all sources in the vicinity of the project that could contribute to the background levels of NOx, CO, PM10 or SO_2 to support cumulative modeling required by the CEC. This would also include sources that are permitted but not yet constructed or ones that are operating well below permitted potential such that the emissions would not be reflected in the monitored background.

On July 3, 2008, Mr. Bret Banks of the Antelope Valley AQMD responded that after consideration of nearby sources, only the sources located at the nearby Lockheed Martin Aeronautical and Northrop Grumman facilities were required to be included in the cumulative modeling. The following is an excerpt from that response letter:

Pursuant to your request for background source emission inventory information, the Antelope Valley AQMD (AVAQMD) has prepared the attached files in electronic format. These files were generated using the HARP program. There are two facilities which the AVAQMD deems necessary to include in your evaluation based upon their industrial processes and facility emissions. Those two facilities are Northrop Grumman, Palmdale and Lockheed Martin Aeronautical, Palmdale.

Should you have any questions regarding the information provided please contact Mr. Chris Anderson at 661 723-8070.

The Applicant subsequently worked with Mr. Chris Anderson of the Antelope Valley AQMD to ensure proper characterization of the sources at those facilities. Complete copies of both letters were included in Appendix G.4 of the PHPP AFC, and Appendix A of the Class II modeling protocol, with a full explanation of how the sources were characterized in the air quality modeling section of the AFC (Section 5.2.4.3).

While it is believed that no further action is required regarding this issue, on April 17, 2009, we requested confirmation via email that no additional sources were required for the cumulative modeling inventory. On April 21, 2009, Mr. Chris Anderson of the Antelope Valley AQMD confirmed, via email, that no other sources were required (see email below):

From: Chris Anderson [mailto:canderson@avaqmd.ca.gov]
Sent: Tuesday, April 21, 2009 2:34 PM
To: Head, Sara
Cc: Alan De Salvio; Bret Banks
Subject: RE: Palmdale Hybrid Power Plant CEC Data Request

Hello Sara,

Per the CEC request from your email below, we have gone ahead and conducted a deliberate search to indeed verify the information provided in the past regarding potential permitting projects. At this time the AVAQMD has not recognized any current or future permitting projects (5 tons/year or greater of any modeled pollutant) within a six mile radius of the proposed PHPP.

I trust that this satisfies the request. Should you have any further questions please let me know.

Regards,

Chris Anderson
Air Quality Engineer
661 723-8070

Data Request 111:

If additional cumulative emission sources are identified, please provide a revised cumulative air quality modeling analysis.

Response:

See Response to Data Request 110.

Data Request 112:

Please provide data, and/or graphical information from GE that substantiates the durations of cold, warm and hot start-up for both turbines using the Rapid Start Process as shown in Table 2-3 and in Appendix G Table 28.

Response:

Please see Attachment DR-112/113 at the end of this section providing GE Rapid Response start-up times (section 5.1).

Data Request 113:

Please provide data, and/or graphical information from GE that substantiates the NOx, VOC and CO emissions for cold, warm and hot start-ups and shutdowns (shown in pounds/event per turbine) presented on pp. 5.2-34, 5.2-35 and 5.2-37, and the hourly start-up emissions during start-up and shutdown shown in Table 5.2-21.

Response:

Please see Attachment DR-112/113 at the end of this section providing GE Rapid Response start-up and shutdown emissions (section 5.2).

Data Request 114:

> Please provide a revised AQIA (including the modeling CD) for construction and operational air quality modeling that reflect the most recent project specifications and emissions.

Response:

An update to the AQIA submitted as part of the AFC for the PHPP is provided in response to this Data Request. This updated AQIA encompasses not only the changes due to Project description changes as provided in PHPP Supplemental Responses #2 to CEC Data Request Set 1 (March 2, 2009), but also reflects the additional modeling requested by CEC in the context of these PHPP CEC Staff Set 2 Data Requests 91-114, as applicable. Note that because inclusion of mobile sources is not required by EPA for Class I modeling, the solar field maintenance vehicles are not part of that analysis and no update to the Class I modeling section was required.

The following changes have been incorporated into the revised AQIA provided in the sections below:

From the Supplemental Responses #2:

- Changes to the conceptual site layout, including a decrease in the acres of solar field and a slight increase in the number of acres (five acres) for the power plant site overall.
- Changes in the power block plot plan and sources, including slight relocation of the combustion turbine stacks, increase in the size of the Auxiliary Boiler from 100 MMBtu/hr to 110 MMBtu/hr and it's stack height (from 30 feet to 60 feet), decrease in the stack heights (from 30 feet to 16 feet) of the emergency diesel generator and fire water pump engine, and relocation of the ammonia storage tank.

In Response to Staff Set 2 Data Requests:

- Additional construction modeling runs to test various worst case locations for the solar field construction area sources for high modeled impacts.
- Revisions to the construction emissions to include: 1) assuming front spray bars on water trucks to reduce fugitive PM emissions from the trucks to zero; and 2) increasing material silt content to 11 percent, which is the conservative default for unpaved roads from the Mojave Desert AQMD guidance.

- Additional modeling for normal operations (Project impacts only and cumulative modeling) and startup/shutdown to include emissions from solar field maintenance vehicles.

The following tables have been updated as a result of the changes described above (AFC Table Reference Included):

- Table 5.2-16: Maximum Daily Combined-Cycle and Solar Array Facility Construction Emissions
- Table 5.2-17: Maximum Annual Onsite Combined-Cycle Facility and Solar Array Construction Emissions
- Table 5.2-21: Maximum Hourly Emissions from Two Combustion Turbines
- Table 5.2-22: Maximum Hourly and Annual Auxiliary Boiler Emissions
- New Table: Maximum Hourly and Annual Maintenance Vehicle Emissions
- Table 5.2-27: Total Annual Potential Emissions, Normal Operation
- Table 5.2-30: NAAQS/CAAQS Analysis for Project Construction
- Table 5.2-34: Stack Parameters and Emissions Data for the Combustion Turbines
- Table 5.2-35: Stack Parameters and Emissions Data for the Ancillary Equipment
- Table 5.2-36: Summary of GEP Analysis
- Table 5.2-37: Maximum Modeled Concentrations for PHPP Normal Operations
- Table 5.2-39: Maximum Modeled Concentrations for Project Startup/Shutdown Operations
- Table 5.2-47: Soils and Vegetation Analysis
- Table 5.2-48: NAAQS/CAAQS Cumulative Modeling Results for Project Normal Operations

Only those tables that have changed due to the revisions listed above are included in this response. In addition, the AQIA discussions from the AFC have been replicated to provide the discussion of the results. As can be seen from the updated results tables, none of the changes or additional sources modeled as a result of these comments change in any way the conclusions put forth in the original AFC.

Table 5.2-16R Maximum Daily Combined-Cycle and Solar Array Facility Construction Emissions

Project Component	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Combined-Cycle Facility, Onsite	254.1	20.2	105.8	0.1	63.6	18.6
Solar Array, Onsite	325.0	23.0	128.9	0.3	52.9	15.1
Combined-Cycle Facility, Off-Site	161.6	16.6	58.7	0.1	19.0	5.3
Solar Array, Off-Site	225.8	24.9	115.2	0.2	28.1	8.7

Table 5.2-17R Maximum Annual Onsite Combined-Cycle Facility and Solar Array Construction Emissions

Project Component	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_2 (tpy)	PM10 (tpy)	PM2.5 (tpy)
Combined-Cycle Facility	32.0	2.4	12.3	< 0.05	7.9	2.3
Solar Array	36.9	2.7	14.4	< 0.05	4.3	1.5

.

Table 5.2-20R Maximum Annual Emissions from Combustion Turbines

Operating Scenario	NO_x (tpy)	CO (tpy)	VOC (tpy)	PM10 (tpy)	SO_2 (tpy)
Continuous Operation all Year	113.7	77.5	39.6	117.1	8.8
Operation with Startup/Shutdown and Offline Periods	88.4	252.6	37.2	n/a	n/a
Maximum Annual Emissions1	113.7	252.6	39.6	117.1	8.8
1 “Maximum Annual Emissions” is the largest total in either the first or second line of this table.					

Table 5.2-21 Maximum Hourly Emissions from Two Combustion Turbines

Operating Mode	NO_X (lb/hr)	CO (lb/hr)	VOC (lb/hr)	PM10 (lb/hr)	SO_2 (lb/hr)
Full-Load Operation					
Without duct firing	26.9	16.4	9.4	24	2.10
With duct firing	33.2	30.3	11.6	36	2.58
Hot Warm Start	60	494	42.0	---	---
Cold Start	105	447	33.8	---	---
Shutdown	228	1,348	116.0	---	---

Table 5.2-22R Maximum Hourly and Annual Auxiliary Boiler Emissions

Pollutant	Hourly Emission Rate (lb/hr)	Annual Emissions (tpy)
NO_X	1.21	0.30
VOC	0.59	0.15
CO	4.05	1.01
SO_2	0.06	0.02
PM10	0.82	0.20

New Table DR-114 Revised Maximum Hourly and Annual Maintenance Vehicle Emissions

Vehicle	Distance		Speed	CO	NOx	SOx	Exh. PM10	Fug. PM10	Exh. PM2.5	Fug. PM2.5
	Miles/yr	Miles/day	Miles/hr	lb/hr						
Mirror Wash Truck	600	4.8	5	0.011	0.021	0.0002	0.0006	2.729	0.0006	0.579
Maintenance Vehicles	19,200	76.8	10	0.012	0.001	0.0001	0.0001	2.774	0.0001	0.588
Weed Abatement	68	40	5	0.011	0.021	0.0002	0.0006	2.729	0.0006	0.579
Soil Stabilizer Application	68	40	5	0.011	0.021	0.0002	0.0006	2.729	0.0006	0.579
Total				**0.045**	**0.065**	**0.0007**	**0.0019**	**10.961**	**0.0019**	**2.324**
				lb/day						
Mirror Wash Truck	600	4.8	5	0.010	0.020	0.0002	0.0006	2.62	0.0006	0.555
Maintenance Vehicles	19,200	76.8	10	0.092	0.007	0.0008	0.0008	21.30	0.0008	4.517
Weed Abatement	68	40	5	0.087	0.170	0.0017	0.0048	21.83	0.0048	4.629
Soil Stabilizer Application	68	40	5	0.087	0.170	0.0017	0.0048	21.83	0.0048	4.629
Total				**0.277**	**0.367**	**0.0044**	**0.0110**	**67.59**	**0.0110**	**14.329**
				tpy						
Mirror Wash Truck	600	4.8	5	0.001	0.001	0.00001	0.00004	0.16	0.00004	0.035
Maintenance Vehicles	19,200	76.8	10	0.012	0.001	0.0001	0.0001	2.66	0.0001	0.565
Weed Abatement	68	40	5	0.0001	0.0001	0.0000	0.0000	0.02	0.0000	0.004
Soil Stabilizer Application	68	40	5	0.0001	0.0001	0.0000	0.0000	0.02	0.0000	0.004
Total				**0.012**	**0.002**	**0.0001**	**0.0001**	**2.86**	**0.0001**	**0.607**

Table 5.2-27R Total Annual Potential Emissions, Normal Operation

Source	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM10/PM2.5 (tpy)	SO_2 (tpy)
Combustion turbines/HRSGs	113.7	252.4	39.64	117.1	8.83
Auxiliary Boiler	0.30	1.01	0.15	0.20	0.02
HTF Heater	0.22	0.74	0.11	0.15	0.012
Emergency Generator	0.67	0.39	0.04	0.022	0.0007
Fire-Water Pump Engine	0.03	0.026	0.001	0.0015	5.0E-05
Cooling Tower	n/a	n/a	n/a	7.13	n/a
Maintenance Vehicles	0.002	0.12	0.03	2.86/0.61	1.12E-04
Total	**114.9**	**254.6**	**40.0**	**127.5/125.2**	**8.9**

Air Quality Impact Assessment

This revised AQIA is essentially the same document as was present in the PHPP AFC, but contains the revised results based on the emissions changes, updates to the stack locations and heights, and inclusion of the vehicle emissions in the solar field. Only the Class II AQIA is provided as no changes were made to the Class I Area impact analyses.

Class II Area Air Quality Impact Assessment

The detailed methodology for the Class II area AQIA is documented in the modeling protocol, "Class II Area Dispersion Modeling Protocol for the Proposed Palmdale Hybrid Power Project". A copy of this protocol is provided in Appendix G.4 of the AFC (no revisions per this update, other than those discussed herein). The analyses were conducted in accordance with the EPA Guideline on Air Quality Models (GAQM; as incorporated in Appendix W of 40 CFR Part 51; EPA, 2005).

Impacts from Project Construction

Construction of the PHPP is anticipated to take 27 months. Construction-related air emissions include exhaust and fugitive dust from vehicle and construction equipment and windblown fugitive dust. All criteria pollutants were modeled to determine maximum air quality impacts. The maximum modeled concentrations were added to background concentrations and compared to the applicable standards.

Construction-related emissions were modeled using the AERMOD model (version 07026). Emissions of criteria pollutants for the construction sources were modeled as layered area sources. Buoyancy and mechanical turbulence from the hot exhaust and mobility of the construction equipment was included as an initial vertical dimension in the area source algorithm. Fugitive dust emissions and on-site motor vehicles were modeled as a single low-level area source, since these emissions would almost all occur near ground level. Construction activities were assumed to occur for 10 hours beginning at 7:00 am and ending at 5:00 pm, and were modeled using the HROFDY option in AERMOD. Emissions were assumed to occur uniformly through the 10 hours of assumed construction activity each day.

For the emission source associated with the power block construction, an area polygon source with a total area of 95,258.5 square meters (m^2) was used. This area represents the size of the power block and was used to compute the emission flux for the power block area. For the construction sources associated with the solar array construction, a rectangular area source with an area of 100,694 m^2 was used. The modeled solar array area represents the largest area that will be under construction at a given time; the solar array construction emission flux is calculated based on this area. The power block sources were located over the proposed footprint for the power block equipment, while the solar array construction sources were placed in 4 different locations to test for worst case impacts over the course of Project construction. The worst case impacts out of the four modeled cases are reported in Table 5.2-30R below. The following locations for the solar field construction source were modeled:

- Just to the west of the power block to allow for potential interaction of plumes from both area sources.
- In the extreme northeast corner of the Project site.
- In the extreme southeast corner of the Project site.
- On the southwestern edge of the Project site

Each of these sources (solar array construction and power block construction) had two overlaid area sources, one for the windblown fugitive and on-site vehicle emissions, and a second for the construction equipment with vertical exhaust pipes. Figure DR-114 (at the end of this section) shows the different locations considered for the solar field construction sources.

A release height of 2.0 m was assumed for the fugitive / on-site vehicles sources, with an initial plume height of 15 feet (4.57 m). Following EPA guidance (EPA, 2004), the initial area source vertical standard deviation for construction combustion emissions was estimated as the plume depth divided by 2.15, or 2.13 m.

The large construction equipment was assumed to have a release height of 3.7 m. The initial vertical depth of the diesel exhaust plume for construction activities was estimated as four times the release (exhaust) height. This height (14.8 m) takes into account the plume rise of the hot diesel exhaust, mechanical mixing on the site introduced by the movement of heavy equipment, and structure wake turbulence introduced by buildings and structures on the Project site. The initial area source vertical standard deviation for the construction equipment is calculated by taking this vertical depth and dividing by 2.15 for an initial sigma-z of 6.88 m. The emissions data used in the modeling were summarized in Section 5.2.4.1 of the AFC.

Concentrations of CO, SO_2, and annual NO_2 were found to be below the NAAQS/CAAQS, but concentrations of 1-hour NO_2, and 24-hour and annual PM10 were shown to exceed the CAAQS. The maximum 1-hour NO_2 concentration exactly equaled the CAAQS without background, while 24-hour and annual PM10 are over the CAAQS only with the addition of the background values, which exceed the CAAQS independent of the Project.

No modeled hours were found to exceed the CAAQS 1-hour NO_2 concentration of 339 $\mu g/m^3$. However, when the worst case ambient background of 139.2 $\mu g/m^3$ was added, the combined Project and ambient background was found to exceed the CAAQS. Upon investigation, all of the NO_2 modeled impacts plus background that exceeded the CAAQS were found to occur during the first and last hour of construction (ending hours 8 am and 5 pm) when low mechanical mixing heights and low wind speed typically occur, are computed by AERMET, and result in high modeled concentrations using AERMOD.

As mitigation of these high modeled NO_2 impacts, AERMOD was rerun to identify those months where morning and/or evening hours could potentially produce exceedance of the NO_2 CAAQS. For each of the three years modeled, an AERMOD "maxifile" was created that identified all hours in each year between the hours beginning at 7:00 am and ending at 5:00 pm where the average hourly concentration (without background) exceeded 199.8 $\mu g/m^3$. This concentration, when added to the highest observed NO_2 background concentration produces a modeled impact equal to the 1-hour NO_2 CAAQS of 339 $\mu g/m^3$. Once the list of potential problem hours was identified, the time-matched hourly NO_2 ambient background was added to the modeled impact and compared to the CAAQS. It was determined that only during the winter months would there be a potential problem during the first and last hours of the work day. An additional set of AERMOD runs were then performed assuming a 10-hour work day (7 am through 5 pm) from March through October, and an 8-hour work day (8 am through 4 pm) from November through February. The maximum modeled impact for 1-hour NO_2 from these runs, when added to the time-matched hourly background, was 296.45 $\mu g/m^3$, which is below the 1-hour NO_2 CAAQS. As a result, construction can be done during the regular 10-hour or more work day from the beginning of March though the end of October. By limiting the work day during the winter months (early November through mid-February) to 8-hour work days, Project construction impacts, when added to the time matched ambient background, comply with the 1-hour NO_2 CAAQS. The construction modeling results are summarized in Table 5.2-30R for all criteria pollutants. An electronic copy of the files containing the NO_2 construction analysis, including the time-matched background calculations, is included in the modeling archive CD.

The maximum modeled 24-hour average for PM10 exceeds the CAAQS when background concentrations are added, because the PM10 air quality monitoring station data show that the CAAQS are already exceeded in this area. The same is true for annual PM10, as the Project impacts represent only 16 percent of the total impact to the annual PM10 concentrations. The same meteorological conditions leading to high early morning and evening NO_2 concentrations will also produce high PM10 concentrations. Thus, the NO_2 mitigation strategy of limiting hours of construction during the winter in order to reduce the NO_2 concentrations also has a positive impact on reducing modeled particulate concentrations. Table 5.2-30R reflects the mitigated impacts for the 1-hour NO_2, and 24-hour and annual PM10 and PM2.5 averaging periods.

Table 5.2-30R NAAQS/CAAQS Analysis for Project Construction

Pollutant	Averaging Period	Concentrations (μg/m³)				
		AERMOD Result	Ambient Background [2]	Total [3]	CAAQS	NAAQS
NO_2 [1]	1-hr	296.45	139.2[5]	296.45	339	--
	Annual	7.94	28.2	36.1	57	100
CO	1-hr	3,349.8	3,680	7030	23,000	40,000
	8-hr	548.4	1,840	2388	10,000	10,000
PM10	24-hr	37.0	86	123.0[4]	50	150
	Annual	3.6	25	28.6[4]	20	--
PM2.5	24-hr	6.6	20	26.6[4]	--	35
	Annual	1.0	8.9	9.9[4]	12	15
SO_2	1-hr	2.5	34.1	36.6	665	--
	3-hr	1.0	23.6	24.6	--	1,300
	24-hr	0.2	15.7	15.9	105	365
	Annual	0.01	5.2	5.2	--	80

[1] Modeled NO_2 concentrations as determined with the OLM.

[2] From Table 5.2-29, these data were collected at the Lancaster Division Street monitor for all pollutants except SO_2 which was collected at the W. Palm Ave monitor in Burbank, CA. These values correspond to the highest monitored values from 2005 – 2007, except for PM2.5, which is the 98th percentile value over three years.

[3] Modeled concentration plus ambient background.

[4] Result reflects 10-hour day from March through October and 8-hour day from November 5 through February 15.

5. Provided for reference only. Total impact includes modeled impact plus time-matched ambient background.

Impacts From PHPP Operation

Air quality modeling during operation was conducted with the AERMOD to demonstrate compliance with the NAAQS and CAAQS and PSD increments in the local (Class II) area. The PHPP includes the following air emission sources that were included in the modeling analysis:

- Two combined-cycle combustion turbines, each with HRSG and duct burners
- Auxiliary boiler
- HTF heater
- Emergency generator engine
- Fire-water pump engine
- Cooling tower
- Solar field maintenance vehicles

AERMOD Application Methodology

Air quality modeling for NAAQS/CAAQS and PSD increment compliance during operation was conducted using the AERMOD model (version 07026). The stack parameters and emission rates input to AERMOD for the combustion turbines for normal operations are summarized in Table 5.2-34. Combustion turbine emission rates and flue gas characteristics were derived for a range of ambient temperatures for natural gas fuel for four operating load points (100 percent with duct burners, 100 percent without duct burners, 75 percent without duct burners and 50 percent without duct burners) that included variable operating factors such as evaporative cooling and solar energy input. For the dispersion modeling, a worst-case composite of emissions and stack data were developed for each of the four load cases to add a measure of conservatism to the analysis. That is, for each load, the highest emission rate and lowest exhaust parameters were identified for the expected range of ambient temperatures and operational cases. Each load was modeled to determine the worst-case for each pollutant to define the turbine stack parameters and emission rates for all Project sources for modeling maximum short-term (≤ 24-hour) impacts. For modeling annual average impacts for the combustion turbines, stack parameters based on 100 percent load and temperatures closest to the representative annual average temperature at 64°F. As noted earlier, because the emissions are estimated at a temperature that is lower than the annual average temperature for the Project area, the predicted annual emissions are higher than may be actually emitted, yielding a conservative impact analysis.

Table 5.2-34R Stack Parameters and Emissions Data for the Combustion Turbines

Parameter		**Value**				
		North Stack			South Stack	
UTM Coordinate East (m) [1]		398680.2			398679.8	
UTM Coordinate North (m) [1]		3833520.8			3833479.7	
Stack Base Elevation (ft)		2,517			2,517	
Stack Height (ft)		145			145	
Stack Diameter (inches)		216			216	
		Load				
		100% w/DB	**100%**	**75%**	**50%**	**Annual Avg.[2]**
Exit Temperature (^{o}F)		172.9	176.5	166.7	166.9	174.1
Exit Velocity (ft/sec)		62.01	61.98	46.26	39.7	64.9
Pollutant Emissions Per Combustion Turbine (lb/hr)	NO_X	16.60	13.47	10.97	8.73	13.0
	CO	15.16	8.20	6.68	5.31	28.8
	PM10/PM2.5	18	12	12	12	13.4
	SO_2	1.29	1.05	0.685	0.68	1.01

[1] Coordinates for UTM Zone 11 referenced to Datum NAD27.

[2] Annual average emissions include normal operations as well as start-up / shutdown. Exit temperature and velocity are the 100 percent load case at 64^{o} F.

The stack parameters and emissions data for the ancillary equipment are listed in Table 5.2-35R. These stack parameters are based on operation of the ancillary equipment at 100 percent load.

Table 5.2-35R Stack Parameters and Emissions Data for the Ancillary Equipment

Parameter	Auxiliary Boiler	Emergency Generator	Fire-Water Pump	HTF Heater	Cooling Tower [2]
UTM Coordinate East (m)[1]	398719.1	398804.9	398600.4	398540.7	398806.4
UTM Coordinate North (m)[1]	3833555.0	3833493.0	3833592.3	3833636.5	3833629.2
Stack Base Elevation (ft)	2,517	2,517	2,517	2,517	2,517
Stack Height (ft)	60	16	16	30	62.34
Stack Diameter (inches)	36	21.6	5.5	20.9	336
Exit Temperature (^oF)	300	761.7	761.7	300	98
Exit Velocity (ft/sec)	67	100	100	74.4	41.4
Short term / Annual Emissions (lb/hr / tpy)					
NO_X	1.21 / 0.30	26.80 / 0.67	1.14 / 0.03	0.44 / 0.22	--
CO	4.05 / 1.01	15.43 / 0.39	1.05 / 0.03	1.47 / 0.74	--
PM10/PM2.5	0.82 / 0.20	0.88 / 0.022	0.06 / 0.0015	0.30 / 0.15	1.63 / 7.13[3]
SO_2	0.06 / 0.02	0.029 / 0.0007	0.002 / 0.00005	0.023 / 0.012	--

1 Coordinates for UTM Zone 11 referenced to Datum NAD27

2 The cooling tower has 10 cells and each was modeled as a single stack. Coordinate provided is the center point of the tower.

3 Cooling tower emissions reflect the entire cooling tower (10 cells).

Also included in the normal operations modeling are the emissions of solar field maintenance vehicles. The emissions for this source are given in Table DR-114 above. For vehicular emissions, a polygonal area source was created covering the entire extent of the solar field. This is appropriate because given operating speeds of 5-10 mph the trucks could easily travel the entire solar field in a given day. The initial dispersion characteristics of the source are the same as for the vehicular emissions / fugitives in the construction modeling: A release height of 2.0 was assumed, with an initial plume height of 15 feet (4.57 m). Following EPA guidance (EPA, 2004), the initial area source vertical standard deviation for vehicular combustion emissions was estimated as the plume depth divided by 2.15, or 2.13 m. The total area of the area source was 1039568.5 m^2 (256.9 acres).

A Good Engineering Practice (GEP) stack height analysis was conducted to evaluate the potential for building downwash. Stacks with heights below GEP are considered to be subject to building downwash and require building dimensions to be input to AERMOD. The GEP stack height analysis was conducted using the EPA Building Profile Input Program (BPIP) (version 04274) that performs the GEP calculation for a multi-building complex on a stack-by-stack basis. The stack locations and building included in the GEP analysis are shown in Figure 5.2-2R (at the end of this section). A summary of the GEP analysis is provided in Table 5.2-36R. The projected combustion turbine stack height of 145 feet (44 m) is less than GEP, but is more than sufficient to demonstrate compliance with air quality standards as shown below. The stack heights of the ancillary equipment will also be less than their respective GEP formula heights and subject to building downwash. Therefore, building dimensions developed by BPIP for all stacks were input to the dispersion model. The BPIP input and output files are provided on the modeling archive CD.

Table 5.2-36R Summary of GEP Analysis

Emission Source	Model Source Name	Stack Height (m)	Controlling Buildings or Structures	Building Height (m)	Projected Width (m)	GEP Formula Height (m)
HRSG Stack (North)	HRSG2	44.2	North and South HRSGs	33.53	33.56	83.82
HRSG Stack (South)	HRSG1	44.2	North and South HRSGs	33.53	33.60	83.82
Auxiliary Boiler	AUXBOIL	18.29	North and South HRSGs	33.53	34.51	83.82
Fire Water Pump Module	FIREPMP	4.88	North and South HRSGs	33.53	54.99	83.82
HTF Heater	GASHTR	9.14	Fire Water Pump Housing	12.19	14.97	30.48
Emergency Generator	EMGEN	4.88	South HRSG and South CTG	27.43	27.59	68.58
Cooling Tower	COOL_01–COOL_10	19.0	North and South HRSGs, STG	21.34 – 33.53	30.84 – 58.79	53.34 – 83.82

Class II Impacts from Project Normal Operations

The modeling of normal PHPP operations using AERMOD was done as a multi-step process. First, the worst-case impacts for the combustion turbines (based on different load and temperatures) were identified. The detailed results for the combustion turbine load analysis are provided in Appendix G.3 in the AFC. The following worst-cases were identified for the pollutants and short-term averaging periods:

- 100 percent with duct firing - CO (1-hr and 8-hr), SO_2 (1-hr, 3-hr and 24-hr), NO_X (1-hr)

- 50 percent - PM/PM10/PM2.5 (24-hr)

As indicated, modeling of pollutants for annual averages was conducted with the load closest to the annual average operating scenario for the turbines (100 percent load / 64°F ambient temperature).

In the next modeling step, the worst-case combustion turbine operating parameters and emissions were combined with normal operations of the facility ancillary sources. The maximum air quality impacts due to emissions from the Project sources are summarized in Table 5.2-37R. Table 5.2-37R lists the maximum modeled concentrations for the Project sources for each year of meteorology. The maxima over the three years modeled is noted and compared to the EPA SILs. Hourly ozone limiting (Ozone Limiting Method [OLM]) was used to more accurately represent the conversion of NO_X to NO_2 for comparison to the California 1-hour NO_2 standard. In using the OLM option in AERMOD, conversion of NO_X emissions to NO_2 concentrations are limited based on the availability of ozone as determined by the ambient background levels. Background ozone levels were obtained from the EPA for the Lancaster Division Street monitoring station (EPA, 2008). As shown in Table 5.2-37R, all maximum modeled impacts are less than their respective SILs with the exception of 24-hour and annual PM10; the maximum 24-hour PM10 result is 18.0 micrograms per cubic meter (µg/m^3) versus the SIL of 5.0 µg/m^3, and the annual result was 1.84 µg/m^3 compared to the SIL of 1.0 µg/m^3. Therefore, no further modeling was required under EPA Guidelines for the other pollutants, but cumulative modeling is required for PM10 to demonstrate compliance with the NAAQS/CAAQS[1]. Additionally, the CEC requires cumulative modeling for all criteria pollutants against their respective CAAQS. Therefore, cumulative modeling was performed for all criteria pollutants.

Because the emergency generator and fire pump will not be operated for more than one hour at a time, it was assumed that these two sources will operated only from 8 am to 9 am in order to model the likely worst-case meteorological conditions (morning stable layer).

As with the normal operations modeling, because the emergency generator and fire pump will not be operated for more than one hour at a time, it was assumed that these two sources will operate only from 8 am to 9 am in order to model the likely worst-case meteorological conditions (morning stable layer).

[1] No PSD increment analysis is required under EPA regulations because PM10 is a non-attainment pollutant in this area. No PM2.5 increment analysis is required because there are no PM2.5 increments yet defined.

Table 5.2-37R Maximum Modeled Concentrations for PHPP Normal Operations

Pollutant	Averaging Period	Maximum AERMOD Concentration (μg/m³)			Overall Maximum (μg/m³)	EPA SIL (μg/m³)
		2002	2003	2004		
NO_2 [1]	1-hr	200.17	203.14	192.73	203.14	--
	Annual	0.98	0.84	0.84	0.98	1
CO	1-hr	330.01	366.96	340.69	366.96	2,000
	8-hr	19.22	19.07	20.38	20.38	500
PM10	24-hr	14.21	17.96	15.59	17.96	5
	Annual	1.84	1.74	1.71	1.84	1
SO_2	1-hr	1.49	1.63	1.55	1.63	--
	3-hr	1.32	1.25	1.33	1.33	25
	24-hr	0.85	0.74	0.83	0.85	5
	Annual	0.07	0.06	0.06	0.07	1

[1] Modeled NO_2 concentrations as determined with the OLM.

Impacts from Combustion Turbine Start-up/Shutdown

Table 5.2-39R Maximum Modeled Concentrations for Project Startup/Shutdown Operations

Pollutant	Averagin g Period	Maximum AERMOD Concentration (μg/m³)	Background Value (μg/m3)	Max Plus Background (μg/m³)	CAAQS (μg/m³)
NO_2	1-hour	314.25[1]	139.2[2]	314.3[1]	339
CO	1-hour	713.80	3,680	4,373.3	23,000
	8-hour	482.04	1840	2,327.9	10,000

[1] Modeled NO_2 concentrations as determined with the OLM. Maximum AERMOD concentration given is modeled impact plus time-matched ambient background.

[2] Given for reference only.

Other Related Analyses

Vegetation and Soils

The updated soils and vegetation analyses results are provided in Table 5.2-47R. As before, impacts are well below the significance criteria and are negligible.

Table 5.2-47R Soils and Vegetation Analysis

Pollutant	Averaging Period	AERMOD Predicted Concentrations (mg/m^3)				Background Value (μg/m^3)	Max Plus Background (μg/m^3)	Significance Level for Impacts to Soil and Vegetation (μg/m^3)
		2002	2003	2004	Max.			
+SO_2	1-hour	1.49	1.63	1.55	1.63	34.1	35.7	917
	3-hour	1.32	1.25	1.33	1.33	23.6	24.9	786
	Annual	0.07	0.06	0.06	0.07	5.2	5.3	18
CO	1-week[1]	19.22	19.07	20.38	20.38	1840	1860.4	1,800,000
NO_2	4-hour[2]	200.17	203.14	192.73	203.14	139.2	342.3	3,760
	8-hour[2]	200.17	203.14	192.73	203.14	139.2	342.3	3,760
	1-month[2]	200.17	203.14	192.73	203.14	139.2	342.3	564
	Annual	0.98	0.84	0.84	0.98	28.2	29.2	94

Short-term numbers based on maximum concentration, annual concentrations are highest annual average concentration.

[1] Used 8-hour CO runs for this period.

[2] Used 1-hour NO_X runs for these periods.

Cumulative Impacts

Cumulative Impacts During Operation

As noted above, cumulative modeling for PM10 is needed for the EPA's PSD analysis and to satisfy the CEC's requirements. The 24-hour PM10 impacts that were greater than the SIL due to the Project alone were very limited and occurred along the fence line and extended to 350 m at the farthest point to the east of the Project site. All other impacts were below the SIL in all other directions. In order to perform the cumulative analysis against the NAAQS and CAAQS for all pollutants, an inventory of background sources was requested from the AVAQMD. The letter requesting the inventory from

AVAQMD is provided in Appendix G.4 in the AFC. Based on verbal correspondence with Mr. Chris Anderson of the AVAQMD, the only nearby background sources that the agency required be included in the cumulative modeling analysis were the nearby Lockheed Martin Aeronautics and Northrop Grumman facilities, both located at or around the Palmdale Regional Airport and within five miles of the Project site. Because of the large number of sources at each facility, the vast majority of which had very low emissions, it was agreed with the agency to model all of the sources that included five percent or more of the emissions for each given pollutant, and then add the remainder of the total emissions to the source that emitted the highest percentage of the emissions in order to have a representative mix of source parameters, and to ensure that all criteria pollutant emissions from the two facilities were included in the modeling. Figure 5.2-3 (in the AFC) shows the locations of the two facilities and the sources that were included in the cumulative modeling.

The NAAQS/CAAQS analysis is summarized in Table 5.2-48R. The Project maximum modeled concentrations for all pollutants are summed with ambient background concentrations for comparison to the air standards. Note that for pollutant impacts less than the SILs (all but 24-hour and annual PM10), compliance is already demonstrated with the NAAQS. The cumulative modeled concentrations are summed with ambient concentrations for comparison with the CAAQS. For pollutants with CAAQS and no SILs (i.e., 1-hour SO_2 and 1-hour NO_2), compliance with the CAAQS is based on the cumulative modeled concentrations plus ambient background concentrations.

Initial modeling of annual NO_2 and annual and 24-hour PM10 and PM2.5 showed abnormally high impacts from some Lockheed and Northrop sources that were located directly adjacent to model receptors on the Lockheed and Northrop properties. In air dispersion modeling against the NAAQS and CAAQS, a source's impact is only counted in "ambient air", i.e. air that is off that facility's property and, therefore, accessible to the public. Since the Lockheed and Northrop sources do not contribute to the concentration against the NAAQS/CAAQS on their own property, two sets of runs were done for each pollutant and period. The first was with all sources included but the receptors that occurred on facility property removed in order to determine the maximum impact cause by those sources away from their own properties. The second contained the entire receptor grid but did not include the source causing abnormally high impacts on its own property in order to determine the maximum Project impacts on that property as well. The maximum impacts given in the table represent the highest value recorded between two sets of runs for each pollutant.

As shown in Table 5.2-48R, the total concentrations comprised of maximum modeled plus maximum background are below the NAAQS and CAAQS for all pollutants with the exception of the 24-hour and annual PM10 CAAQS, for which the ambient background already exceeds the standard and Project contributions are relatively small (37 percent and 9 percent of the 24-hour and annual PM10 CAAQS, respectively). Since the Project exceeds the AVAQMD offset thresholds, and will be required to secure emission offsets in order to obtain an operating permit (see Section 5.2.1.3 of the AFC), the Project will result in a net air quality benefit for PM10 in the region.

Table 5.2-48R NAAQS/CAAQS Cumulative Modeling Results for Project Normal Operations

Pollutant	Averaging Period	Concentrations ($\mu g/m^3$)				
		AERMOD Result	Ambient Background [2]	Total [3]	CAAQS	NAAQS
NO_2 [1]	1-hr	291.1[5]	139.2	291.1[5]	339	--
	Annual[6]	6.09	28.2	34.3	57	100
CO	1-hr	366.97	3680	4047.0	23,000	40,000
	8-hr	20.38	1840	1860.4	10,000	10,000
PM10	24-hr[6]	18.51	86.0	104.5	50	150
	Annual[6]	1.83	25.0	26.8	20	--[4]
PM2.5	24-hr	11.63	17.0	28.6	--	35
	Annual[6]	1.27	8.9	10.2	12	15
SO_2	1-hr	1.68	34.1	35.8	665	--
	3-hr	1.33	23.6	24.9	--	1,300
	24-hr	0.85	15.7	16.6	105	365
	Annual	0.23	5.2	5.4	--	80

[1] Modeled NO_2 concentrations as determined with the OLM.

[2] Highest value from Table 5.2-30

[3] Modeled concentration plus ambient background.

[4] The annual PM10 NAAQS of 50 $\mu g/m^3$ was revoked by EPA on September 21st, 2006. Federal Register Vol. 71 Number 200 10/17/2006.

[5] Value given in AERMOD result and Total include maximum modeled impact plus time matched ambient backgrounds. Maximum ambient background for 1-hour NO_2 is given only for reference.

[6] See modeling discussion for how these values were determined.

Figure DR-114 Location of Revised Construction Emission Sources

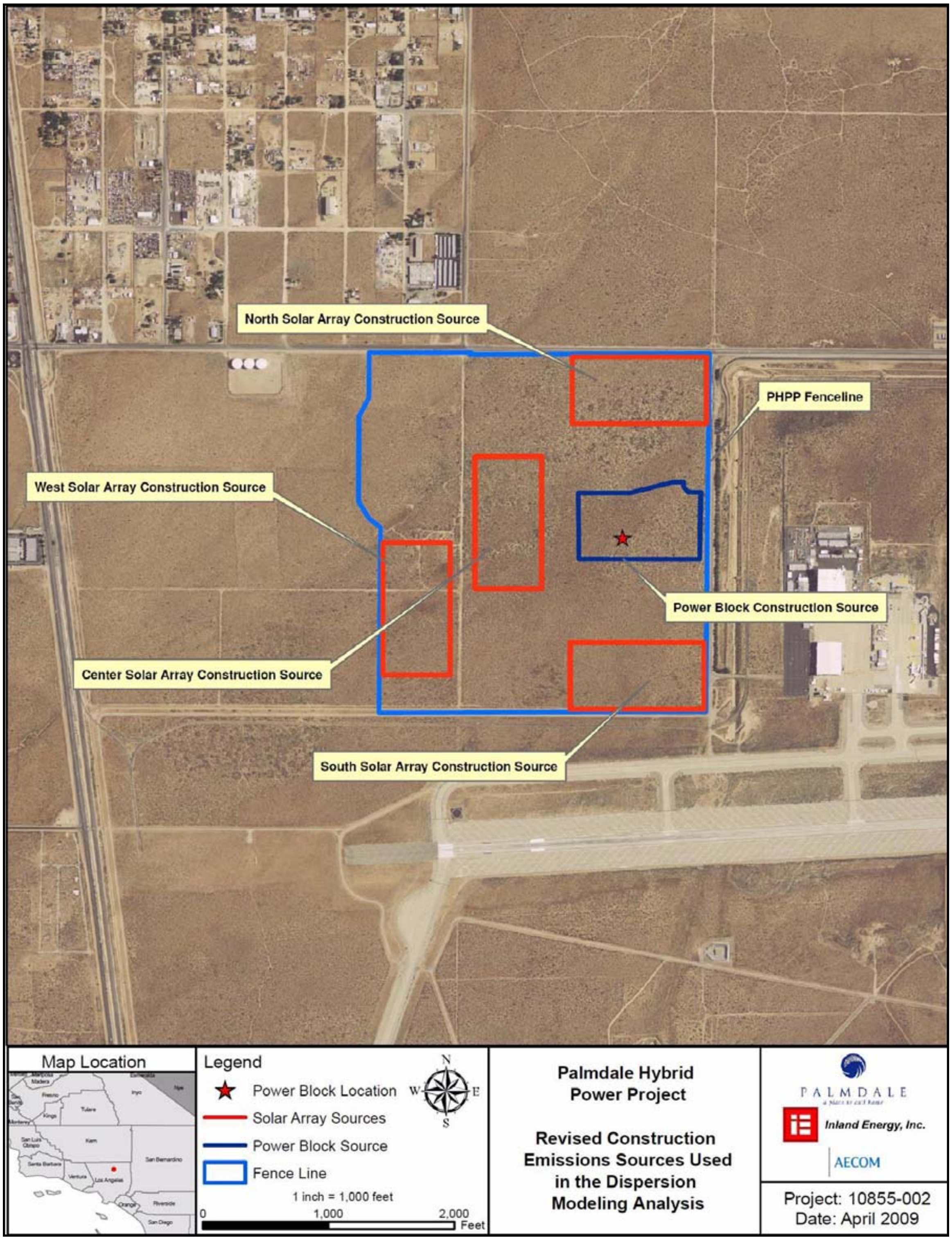
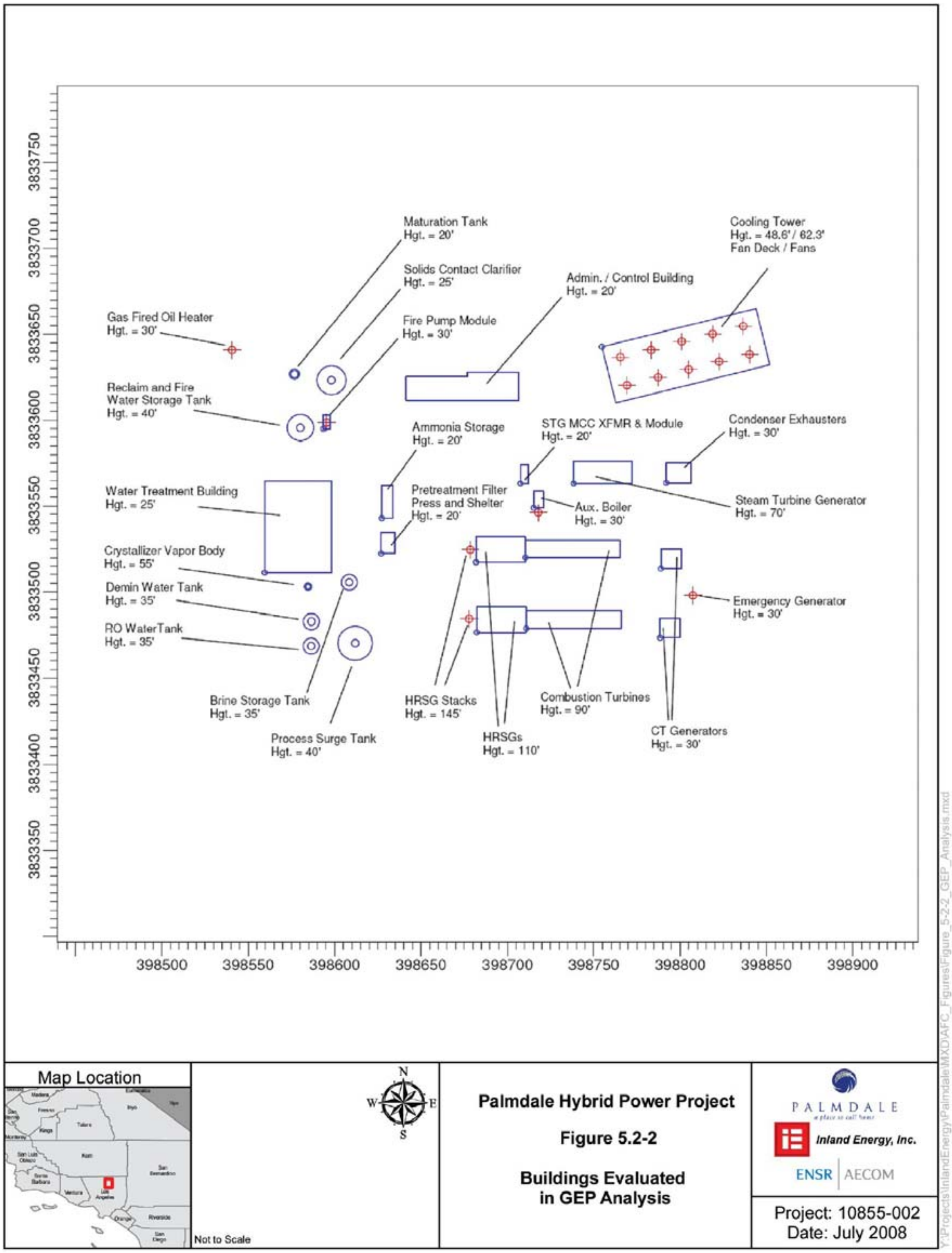


Figure 5.2-2R Buildings Evaluated in the GEP Analysis



Air Quality

Attachment DR-94

Revised Facility and Solar Array Construction PM Detailed Emission Calculations

Table 1
Diesel Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Aerial Lifts	0	15	0.0530	0.0690	0.0041	0.0001	0.0107
Aerial Lifts	16	25	0.0584	0.1022	0.0068	0.0001	0.0214
Aerial Lifts	26	50	0.1873	0.1963	0.0184	0.0003	0.0723
Aerial Lifts	51	120	0.2477	0.4489	0.0352	0.0004	0.0686
Aerial Lifts	121	500	0.5865	1.8940	0.0591	0.0021	0.1470
Aerial Lifts	501	750	1.0601	3.5229	0.1084	0.0039	0.2749
Agricultural Mowers	0	120	0.2317	0.4381	0.0339	0.0004	0.0677
Agricultural Tractors	0	15	0.0643	0.0770	0.0039	0.0002	0.0123
Agricultural Tractors	16	25	0.0839	0.1645	0.0091	0.0003	0.0256
Agricultural Tractors	26	50	0.3763	0.3596	0.0367	0.0004	0.1550
Agricultural Tractors	51	120	0.4948	0.9348	0.0754	0.0009	0.1485
Agricultural Tractors	121	175	0.6843	1.4229	0.0720	0.0014	0.1679
Agricultural Tractors	176	250	0.4790	1.8992	0.0619	0.0020	0.1615
Agricultural Tractors	251	500	0.9402	2.8342	0.0934	0.0029	0.2373
Air Compressors	0	15	0.0509	0.0828	0.0060	0.0001	0.0142
Air Compressors	16	25	0.0833	0.1389	0.0098	0.0002	0.0318
Air Compressors	26	50	0.2699	0.2354	0.0257	0.0003	0.1108
Air Compressors	51	120	0.3302	0.5945	0.0527	0.0006	0.0986
Air Compressors	121	175	0.5044	0.9972	0.0547	0.0010	0.1228
Air Compressors	176	250	0.3432	1.3883	0.0459	0.0015	0.1204
Air Compressors	251	500	0.6904	2.1770	0.0743	0.0023	0.1896
Air Compressors	501	750	1.0669	3.4628	0.1167	0.0036	0.2992
Air Compressors	751	1000	1.8299	5.9572	0.1765	0.0049	0.5084
Balers	0	50	0.2875	0.3588	0.0296	0.0005	0.1065
Balers	51	120	0.3362	0.6373	0.0435	0.0006	0.0912
Bore/Drill Rigs	0	15	0.0631	0.0756	0.0038	0.0002	0.0121
Bore/Drill Rigs	16	25	0.0664	0.1295	0.0072	0.0002	0.0201
Bore/Drill Rigs	26	50	0.2616	0.2855	0.0223	0.0004	0.0676
Bore/Drill Rigs	51	120	0.4868	0.6821	0.0525	0.0009	0.0865
Bore/Drill Rigs	121	175	0.7538	1.0246	0.0531	0.0016	0.1060
Bore/Drill Rigs	176	250	0.3476	1.3151	0.0396	0.0021	0.1002
Bore/Drill Rigs	251	500	0.5590	1.8499	0.0625	0.0031	0.1523

Table 1
Diesel Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Bore/Drill Rigs	501	750	1.1046	3.8094	0.1260	0.0062	0.3089
Bore/Drill Rigs	751	1000	1.7273	8.7633	0.2164	0.0093	0.5756
Cement and Mortar Mixers	0	15	0.0390	0.0531	0.0033	0.0001	0.0082
Cement and Mortar Mixers	16	25	0.0987	0.1677	0.0116	0.0002	0.0372
Chippers/Stump Grinders	0	25	0.0829	0.1580	0.0086	0.0003	0.0246
Chippers/Stump Grinders	26	120	0.4995	0.8964	0.0715	0.0009	0.1373
Chippers/Stump Grinders	121	175	0.7049	1.3794	0.0684	0.0015	0.1564
Chippers/Stump Grinders	176	250	0.5658	2.2030	0.0709	0.0025	0.1821
Chippers/Stump Grinders	251	500	0.7058	2.2037	0.0727	0.0024	0.1805
Chippers/Stump Grinders	501	750	1.6990	5.4553	0.1776	0.0060	0.4476
Chippers/Stump Grinders	751	1000	2.9746	9.8719	0.2886	0.0085	0.8156
Combines	0	120	0.5930	1.1235	0.0789	0.0011	0.1636
Combines	121	175	0.6309	1.3131	0.0578	0.0014	0.1410
Combines	176	250	0.4269	1.7267	0.0492	0.0020	0.1314
Combines	251	500	0.6289	2.2088	0.0644	0.0024	0.1649
Commercial Turf Equipment	0	15	0.0589	0.0718	0.0040	0.0002	0.0102
Commercial Turf Equipment	16	25	0.0596	0.1119	0.0058	0.0002	0.0176
Compressor (Entertainment)	0	120	0.2501	0.4629	0.0410	0.0004	0.0776
Compressor (Railyard)	0	120	0.2329	0.4310	0.0381	0.0004	0.0722
Concrete/Industrial Saws	0	25	0.0678	0.1294	0.0071	0.0002	0.0201
Concrete/Industrial Saws	26	50	0.3305	0.3118	0.0318	0.0004	0.1324
Concrete/Industrial Saws	51	120	0.5026	0.9098	0.0757	0.0009	0.1444
Concrete/Industrial Saws	121	175	0.8816	1.7496	0.0905	0.0018	0.2062
Crane (Rail-CHE)	0	120	0.3864	0.7150	0.0633	0.0006	0.1199
Crane (Rail-CHE)	121	175	0.3626	0.7432	0.0355	0.0008	0.0837
Cranes	0	50	0.3264	0.2582	0.0305	0.0003	0.1378
Cranes	51	120	0.3763	0.6897	0.0636	0.0006	0.1191
Cranes	121	175	0.4902	0.9859	0.0566	0.0009	0.1281
Cranes	176	250	0.3642	1.3109	0.0499	0.0013	0.1310
Cranes	251	500	0.7101	1.8726	0.0722	0.0018	0.1906
Cranes	501	750	1.1948	3.2346	0.1233	0.0030	0.3231
Cranes	751	9999	4.4278	12.6241	0.3953	0.0098	1.1449

Table 1
Diesel Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Crawler Tractors	0	50	0.3618	0.2814	0.0337	0.0003	0.1545
Crawler Tractors	51	120	0.5079	0.9509	0.0865	0.0008	0.1651
Crawler Tractors	121	175	0.7652	1.5628	0.0900	0.0014	0.2048
Crawler Tractors	176	250	0.5990	2.0518	0.0825	0.0019	0.2142
Crawler Tractors	251	500	1.2793	2.8640	0.1150	0.0025	0.3022
Crawler Tractors	501	750	2.2933	5.2558	0.2087	0.0047	0.5451
Crawler Tractors	751	1000	3.6259	8.8977	0.2936	0.0066	0.8350
Crushing/Proc. Equipment	0	50	0.5721	0.4757	0.0543	0.0006	0.2406
Crushing/Proc. Equipment	51	120	0.6002	1.0901	0.1000	0.0010	0.1865
Crushing/Proc. Equipment	121	175	0.9755	1.9619	0.1110	0.0019	0.2492
Crushing/Proc. Equipment	176	250	0.6581	2.6861	0.0897	0.0027	0.2382
Crushing/Proc. Equipment	251	500	1.1456	3.6395	0.1257	0.0037	0.3256
Crushing/Proc. Equipment	501	750	1.7588	5.9501	0.2007	0.0059	0.5224
Crushing/Proc. Equipment	751	9999	5.1524	16.5812	0.5006	0.0131	1.4540
Dumpers/Tenders	0	25	0.0344	0.0662	0.0039	0.0001	0.0113
Excavators	0	25	0.0676	0.1271	0.0066	0.0002	0.0200
Excavators	26	50	0.3270	0.2679	0.0298	0.0003	0.1260
Excavators	51	120	0.5376	0.9006	0.0846	0.0009	0.1527
Excavators	121	175	0.6713	1.2030	0.0708	0.0013	0.1573
Excavators	176	250	0.4123	1.6087	0.0554	0.0018	0.1528
Excavators	251	500	0.6561	2.0649	0.0751	0.0023	0.2069
Excavators	501	750	1.0875	3.5414	0.1269	0.0039	0.3460
Forklifts	0	50	0.1852	0.1541	0.0170	0.0002	0.0706
Forklifts	51	120	0.2245	0.3638	0.0356	0.0004	0.0627
Forklifts	121	175	0.3291	0.5759	0.0347	0.0006	0.0758
Forklifts	176	250	0.1715	0.7435	0.0230	0.0009	0.0653
Forklifts	251	500	0.2376	0.9183	0.0309	0.0011	0.0864
Generator (Entertainment)	0	50	0.4225	0.4431	0.0418	0.0006	0.1665
Generator (Entertainment)	51	120	0.5820	1.0832	0.0832	0.0010	0.1657
Generator (Entertainment)	121	175	0.7911	1.6213	0.0775	0.0017	0.1826
Generator (Entertainment)	176	250	0.5299	2.0299	0.0649	0.0022	0.1690
Generator (Entertainment)	251	500	0.8467	2.6012	0.0844	0.0027	0.2133

Table 1
Diesel Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Generator (Entertainment)	501	750	1.6621	5.2270	0.1676	0.0055	0.4304
Generator (Entertainment)	751	9999	3.6146	11.4568	0.3456	0.0097	0.9794
Generator (Railyard)	0	175	0.7370	1.5105	0.0722	0.0016	0.1701
Generator (Railyard)	176	9999	3.2914	10.4323	0.3147	0.0088	0.8918
Generator Sets	0	15	0.0720	0.1143	0.0070	0.0002	0.0172
Generator Sets	16	25	0.1017	0.1696	0.0108	0.0002	0.0302
Generator Sets	26	50	0.2823	0.3044	0.0279	0.0004	0.1076
Generator Sets	51	120	0.5015	0.9082	0.0699	0.0009	0.1371
Generator Sets	121	175	0.7420	1.4703	0.0702	0.0016	0.1630
Generator Sets	176	250	0.5061	2.0685	0.0616	0.0024	0.1603
Generator Sets	251	500	0.8992	2.9695	0.0911	0.0033	0.2264
Generator Sets	501	750	1.4516	4.9315	0.1493	0.0055	0.3788
Generator Sets	751	9999	3.5400	12.0699	0.3524	0.0105	0.9922
Graders	0	50	0.3703	0.3003	0.0344	0.0004	0.1517
Graders	51	120	0.5520	0.9824	0.0904	0.0009	0.1672
Graders	121	175	0.7439	1.4427	0.0828	0.0014	0.1857
Graders	176	250	0.5161	1.9057	0.0702	0.0019	0.1853
Graders	251	500	0.8048	2.2465	0.0849	0.0023	0.2242
Graders	501	750	1.7035	4.8949	0.1824	0.0049	0.4788
Hydro Power Units	0	15	0.0367	0.0440	0.0022	0.0001	0.0070
Hydro Power Units	16	25	0.0475	0.0932	0.0052	0.0001	0.0145
Hydro Power Units	26	50	0.2742	0.2303	0.0261	0.0003	0.1171
Hydro Power Units	51	120	0.3032	0.5703	0.0501	0.0005	0.0957
Lawn & Garden Tractors	0	15	0.0573	0.0772	0.0046	0.0001	0.0110
Lawn & Garden Tractors	16	25	0.0605	0.1187	0.0066	0.0002	0.0181
Leaf Blowers/Vacuums	0	15	0.0184	0.0240	0.0014	0.0000	0.0034
Leaf Blowers/Vacuums	16	120	0.2960	0.5322	0.0369	0.0006	0.0742
Leaf Blowers/Vacuums	121	250	0.2318	0.9201	0.0259	0.0011	0.0672
Materials Handling (Rail-CHE)	0	120	0.4241	0.7848	0.0695	0.0007	0.1316
Off-Highway Tractors	0	120	0.7523	1.4797	0.1310	0.0011	0.2582
Off-Highway Tractors	121	175	0.8632	1.8476	0.1057	0.0015	0.2431
Off-Highway Tractors	176	250	0.5542	1.7817	0.0767	0.0015	0.1952

Table 1
Diesel Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Off-Highway Tractors	251	750	3.7778	7.1499	0.2974	0.0057	0.7664
Off-Highway Tractors	751	1000	5.8599	11.8061	0.4167	0.0082	1.1649
Off-Highway Trucks	0	175	0.7640	1.3786	0.0821	0.0014	0.1851
Off-Highway Trucks	176	250	0.4516	1.7369	0.0613	0.0019	0.1723
Off-Highway Trucks	251	500	0.8057	2.4800	0.0921	0.0027	0.2596
Off-Highway Trucks	501	750	1.3069	4.1577	0.1521	0.0044	0.4243
Off-Highway Trucks	751	1000	2.2155	7.6471	0.2324	0.0063	0.6741
Other Agricultural Equipment	0	15	0.0468	0.0586	0.0035	0.0001	0.0092
Other Agricultural Equipment	16	25	0.0711	0.1287	0.0083	0.0002	0.0253
Other Agricultural Equipment	26	50	0.2620	0.2647	0.0258	0.0003	0.1059
Other Agricultural Equipment	51	120	0.3397	0.6423	0.0500	0.0006	0.0998
Other Agricultural Equipment	121	175	0.4979	1.0356	0.0506	0.0010	0.1193
Other Agricultural Equipment	176	250	0.3515	1.4003	0.0441	0.0015	0.1158
Other Agricultural Equipment	251	500	0.5928	1.8471	0.0590	0.0019	0.1502
Other Construction Equipment	0	15	0.0617	0.0739	0.0037	0.0002	0.0118
Other Construction Equipment	16	25	0.0549	0.1070	0.0059	0.0002	0.0166
Other Construction Equipment	26	50	0.3036	0.2831	0.0283	0.0004	0.1140
Other Construction Equipment	51	120	0.5475	0.9250	0.0794	0.0009	0.1448
Other Construction Equipment	121	175	0.5910	1.0686	0.0576	0.0012	0.1265
Other Construction Equipment	176	500	0.6496	2.1214	0.0719	0.0025	0.1811
Other General Industrial Equipmen	0	15	0.0390	0.0466	0.0019	0.0001	0.0066
Other General Industrial Equipmen	16	25	0.0631	0.1186	0.0062	0.0002	0.0186
Other General Industrial Equipmen	26	50	0.2984	0.2384	0.0280	0.0003	0.1241
Other General Industrial Equipmen	51	120	0.4594	0.8191	0.0777	0.0007	0.1428
Other General Industrial Equipmen	121	175	0.5755	1.1267	0.0659	0.0011	0.1472
Other General Industrial Equipmen	176	250	0.3691	1.4939	0.0507	0.0015	0.1374
Other General Industrial Equipmen	251	500	0.8154	2.5670	0.0909	0.0026	0.2441
Other General Industrial Equipmen	501	750	1.3439	4.3631	0.1525	0.0044	0.4062
Other General Industrial Equipmen	751	1000	2.1683	7.0865	0.2158	0.0056	0.6218
Other Lawn & Garden Equipment	0	15	0.0746	0.0930	0.0054	0.0002	0.0132
Other Lawn & Garden Equipment	16	25	0.0671	0.1279	0.0069	0.0002	0.0199
Other Material Handling Equipment	0	50	0.4112	0.3313	0.0387	0.0004	0.1712

Table 1
Diesel Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Other Material Handling Equipment	51	120	0.4468	0.7980	0.0753	0.0007	0.1385
Other Material Handling Equipment	121	175	0.7283	1.4289	0.0831	0.0014	0.1854
Other Material Handling Equipment	176	250	0.3931	1.5924	0.0539	0.0016	0.1453
Other Material Handling Equipment	251	500	0.5871	1.8490	0.0652	0.0019	0.1737
Other Material Handling Equipment	501	9999	2.8662	9.3573	0.2838	0.0073	0.8180
Pavers	0	25	0.0868	0.1646	0.0100	0.0002	0.0293
Pavers	26	50	0.3945	0.3144	0.0371	0.0004	0.1710
Pavers	51	120	0.5282	1.0144	0.0891	0.0008	0.1731
Pavers	121	175	0.8021	1.6828	0.0942	0.0014	0.2152
Pavers	176	250	0.7315	2.4486	0.1001	0.0022	0.2540
Pavers	251	500	1.2522	2.6502	0.1068	0.0023	0.2728
Paving Equipment	0	25	0.0524	0.1023	0.0057	0.0002	0.0159
Paving Equipment	26	50	0.3346	0.2683	0.0316	0.0003	0.1454
Paving Equipment	51	120	0.4130	0.7951	0.0696	0.0006	0.1353
Paving Equipment	121	175	0.6256	1.3197	0.0733	0.0011	0.1678
Paving Equipment	176	250	0.4562	1.5335	0.0623	0.0014	0.1580
Plate Compactors	0	15	0.0263	0.0321	0.0018	0.0001	0.0051
Pressure Washers	0	15	0.0345	0.0548	0.0033	0.0001	0.0082
Pressure Washers	16	25	0.0412	0.0687	0.0044	0.0001	0.0122
Pressure Washers	26	50	0.1124	0.1380	0.0114	0.0002	0.0404
Pressure Washers	51	120	0.1481	0.2686	0.0190	0.0003	0.0384
Pumps	0	15	0.0524	0.0851	0.0062	0.0001	0.0146
Pumps	16	25	0.1124	0.1874	0.0132	0.0002	0.0429
Pumps	26	50	0.3322	0.3446	0.0326	0.0004	0.1287
Pumps	51	120	0.5089	0.9211	0.0727	0.0009	0.1414
Pumps	121	175	0.7430	1.4721	0.0721	0.0016	0.1662
Pumps	176	250	0.4883	1.9884	0.0606	0.0023	0.1574
Pumps	251	500	0.9555	3.0765	0.0965	0.0034	0.2402
Pumps	501	750	1.5797	5.2324	0.1619	0.0057	0.4105
Pumps	751	9999	4.7215	15.7553	0.4622	0.0136	1.3044
Rollers	0	15	0.0386	0.0462	0.0023	0.0001	0.0074
Rollers	16	25	0.0554	0.1081	0.0060	0.0002	0.0168

Table 1
Diesel Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Rollers	26	50	0.3253	0.2791	0.0307	0.0003	0.1354
Rollers	51	120	0.4218	0.7773	0.0674	0.0007	0.1282
Rollers	121	175	0.6294	1.2714	0.0689	0.0012	0.1567
Rollers	176	250	0.4769	1.7161	0.0639	0.0017	0.1636
Rollers	251	500	0.8338	2.2032	0.0824	0.0021	0.2094
Rough Terrain Forklifts	0	50	0.4333	0.3613	0.0403	0.0004	0.1736
Rough Terrain Forklifts	51	120	0.4494	0.7800	0.0720	0.0007	0.1312
Rough Terrain Forklifts	121	175	0.7322	1.3795	0.0792	0.0014	0.1754
Rough Terrain Forklifts	176	250	0.4526	1.7807	0.0610	0.0019	0.1625
Rough Terrain Forklifts	251	500	0.7444	2.3488	0.0840	0.0025	0.2213
Rubber Tired Dozers	0	175	0.8754	1.8689	0.1079	0.0015	0.2501
Rubber Tired Dozers	176	250	0.8027	2.5564	0.1115	0.0021	0.2871
Rubber Tired Dozers	251	500	1.8376	3.3367	0.1418	0.0026	0.3728
Rubber Tired Dozers	501	750	2.7667	5.1169	0.2155	0.0040	0.5636
Rubber Tired Dozers	751	1000	4.4268	8.7329	0.3134	0.0059	0.8763
Rubber Tired Loaders	0	25	0.0696	0.1329	0.0073	0.0002	0.0207
Rubber Tired Loaders	26	50	0.4139	0.3381	0.0385	0.0004	0.1692
Rubber Tired Loaders	51	120	0.4315	0.7662	0.0703	0.0007	0.1299
Rubber Tired Loaders	121	175	0.6348	1.2278	0.0702	0.0012	0.1573
Rubber Tired Loaders	176	250	0.4407	1.6353	0.0597	0.0017	0.1575
Rubber Tired Loaders	251	500	0.8154	2.2999	0.0863	0.0023	0.2270
Rubber Tired Loaders	501	750	1.6704	4.8510	0.1795	0.0049	0.4698
Rubber Tired Loaders	751	1000	2.3885	7.4130	0.2251	0.0060	0.6494
Sailboat Auxiliary Inboard Engine	0	50	0.0979	0.2218	0.0055	0.0002	0.0652
Scrapers	0	120	0.7254	1.3688	0.1239	0.0011	0.2373
Scrapers	121	175	0.9360	1.9281	0.1105	0.0017	0.2518
Scrapers	176	250	0.7689	2.6145	0.1058	0.0024	0.2735
Scrapers	251	500	1.6306	3.5949	0.1449	0.0032	0.3788
Scrapers	501	750	2.8169	6.3528	0.2532	0.0056	0.6584
Signal Boards	0	15	0.0376	0.0449	0.0018	0.0001	0.0072
Signal Boards	16	50	0.3909	0.3736	0.0380	0.0005	0.1581
Signal Boards	51	120	0.5423	0.9917	0.0826	0.0009	0.1592

Table 1
Diesel Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Signal Boards	121	175	0.8456	1.7079	0.0879	0.0017	0.2020
Signal Boards	176	250	0.6486	2.6460	0.0839	0.0029	0.2193
Skid Steer Loaders	0	25	0.0733	0.1285	0.0086	0.0002	0.0268
Skid Steer Loaders	26	50	0.2617	0.2505	0.0239	0.0003	0.0899
Skid Steer Loaders	51	120	0.2853	0.4482	0.0390	0.0005	0.0683
Sprayers	0	25	0.0742	0.1179	0.0087	0.0002	0.0293
Sprayers	26	50	0.1775	0.2225	0.0183	0.0003	0.0656
Sprayers	51	120	0.3512	0.6657	0.0454	0.0007	0.0951
Sprayers	121	175	0.4717	0.9818	0.0419	0.0011	0.1033
Sprayers	176	250	0.3706	1.5055	0.0416	0.0017	0.1118
Sprayers	251	500	0.4222	1.5365	0.0436	0.0017	0.1119
Surfacing Equipment	0	50	0.1559	0.1470	0.0149	0.0002	0.0629
Surfacing Equipment	51	120	0.4378	0.8090	0.0656	0.0007	0.1278
Surfacing Equipment	121	175	0.4808	0.9695	0.0495	0.0010	0.1140
Surfacing Equipment	176	250	0.4059	1.4560	0.0521	0.0015	0.1331
Surfacing Equipment	251	500	0.8307	2.1620	0.0776	0.0022	0.1956
Surfacing Equipment	501	750	1.3033	3.4771	0.1233	0.0035	0.3135
Swathers	0	120	0.3329	0.6310	0.0434	0.0006	0.0908
Swathers	121	175	0.5182	1.0785	0.0465	0.0012	0.1143
Sweepers/Scrubbers	0	15	0.0728	0.0869	0.0036	0.0002	0.0124
Sweepers/Scrubbers	16	25	0.0807	0.1539	0.0084	0.0002	0.0240
Sweepers/Scrubbers	26	50	0.3884	0.3302	0.0362	0.0004	0.1536
Sweepers/Scrubbers	51	120	0.5310	0.8930	0.0850	0.0009	0.1519
Sweepers/Scrubbers	121	175	0.7992	1.4624	0.0858	0.0016	0.1870
Sweepers/Scrubbers	176	250	0.3645	1.5952	0.0489	0.0018	0.1336
Tillers	0	15	0.0419	0.0552	0.0033	0.0001	0.0078
Tillers	16	250	0.5870	2.3704	0.0682	0.0027	0.1819
Tillers	251	500	1.1324	3.9279	0.1156	0.0042	0.2959
Tractors/Loaders/Backhoes	0	25	0.0695	0.1354	0.0079	0.0002	0.0224
Tractors/Loaders/Backhoes	26	50	0.3694	0.3165	0.0338	0.0004	0.1403
Tractors/Loaders/Backhoes	51	120	0.3664	0.6082	0.0558	0.0006	0.1000
Tractors/Loaders/Backhoes	121	175	0.5890	1.0439	0.0601	0.0011	0.1316

Table 1
Diesel Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Tractors/Loaders/Backhoes	176	250	0.4214	1.6717	0.0557	0.0019	0.1501
Tractors/Loaders/Backhoes	251	500	0.8961	2.9218	0.1034	0.0039	0.2750
Tractors/Loaders/Backhoes	501	750	1.3442	4.5411	0.1582	0.0058	0.4176
Transport Refrigeration Units	0	15	0.0497	0.0683	0.0041	0.0001	0.0097
Transport Refrigeration Units	16	25	0.0588	0.1155	0.0064	0.0002	0.0175
Transport Refrigeration Units	26	50	0.2520	0.2473	0.0220	0.0003	0.0747
Trenchers	0	15	0.0516	0.0616	0.0025	0.0001	0.0098
Trenchers	16	25	0.1354	0.2585	0.0141	0.0004	0.0402
Trenchers	26	50	0.4450	0.3659	0.0421	0.0004	0.1926
Trenchers	51	120	0.4892	0.9488	0.0808	0.0008	0.1593
Trenchers	121	175	0.8909	1.8834	0.1029	0.0016	0.2367
Trenchers	176	250	0.8496	2.8069	0.1154	0.0025	0.2900
Trenchers	251	500	1.7481	3.5537	0.1430	0.0031	0.3611
Trenchers	501	750	3.2955	6.8325	0.2720	0.0059	0.6889
Vessels w/Inboard Engines	0	250	0.8849	2.0108	0.0504	0.0012	0.5888
Welders	0	15	0.0438	0.0712	0.0052	0.0001	0.0122
Welders	16	25	0.0651	0.1085	0.0076	0.0001	0.0249
Welders	26	50	0.2908	0.2691	0.0280	0.0003	0.1173
Welders	51	120	0.2703	0.4879	0.0415	0.0005	0.0787
Welders	121	175	0.5450	1.0790	0.0569	0.0011	0.1288
Welders	176	250	0.3038	1.2292	0.0398	0.0013	0.1035
Welders	251	500	0.4913	1.5453	0.0514	0.0016	0.1296

[a] These are composite horsepower-based off-road emission factors for 2009 developed by running CARB's OFFROAD2007 Model (December 15, 2006 version).
Total daily emissions from the model for each type of equipment within each horsepower range were divided by the total daily operating hours for the equipment within each horsepower range to calculate hourly emissions from individual pieces of equipment.

Table 2
Four-stroke Gasoline Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
2-Wheel Tractors	0	5	0.9037	0.0255	0.0008	0.0001	0.0569
2-Wheel Tractors	6	15	2.7777	0.0538	0.0394	0.0001	0.0728
2-Wheel Tractors	16	25	5.8966	0.0995	0.0787	0.0002	0.1538
Aerial Lifts	0	15	3.3514	0.0647	0.0475	0.0002	0.0875
Aerial Lifts	16	25	5.2051	0.0891	0.0694	0.0002	0.1387
Aerial Lifts	26	50	2.8055	0.1307	0.0020	0.0003	0.0778
Aerial Lifts	51	120	2.0131	0.3333	0.0041	0.0005	0.0952
Agricultural Mowers	0	15	2.3356	0.0382	0.0302	0.0001	0.0730
Agricultural Mowers	16	25	5.4172	0.0782	0.0679	0.0002	0.1603
Agricultural Tractors	0	120	5.7786	1.0105	0.0067	0.0008	0.3623
Agricultural Tractors	121	175	4.6494	1.7364	0.0103	0.0013	0.2436
Air Compressors	0	5	0.8424	0.0318	0.0009	0.0001	0.0711
Air Compressors	0	5	0.8404	0.0318	0.0009	0.0001	0.0709
Air Compressors	6	15	2.2030	0.0445	0.0311	0.0001	0.0602
Air Compressors	6	15	2.2018	0.0433	0.0311	0.0001	0.0591
Air Compressors	16	25	5.6788	0.0998	0.0756	0.0002	0.1544
Air Compressors	16	25	5.7144	0.0963	0.0756	0.0002	0.1560
Air Compressors	26	50	4.6666	0.2625	0.0026	0.0004	0.1867
Air Compressors	51	120	4.0001	0.7284	0.0052	0.0006	0.2493
Air Compressors	121	175	4.2912	1.5657	0.0099	0.0012	0.2167
All Terrain Vehicles (ATVs) Active	0	15	0.0631	0.0016	0.0001	0.0003	0.0028
All Terrain Vehicles (ATVs) Active	16	25	0.0631	0.0016	0.0001	0.0003	0.0028
All Terrain Vehicles (ATVs) Active	26	50	0.0631	0.0016	0.0001	0.0005	0.0028
All Terrain Vehicles (ATVs) Inactive	0	15	0.0000	0.0000	0.0000	0.0000	0.0000
All Terrain Vehicles (ATVs) Inactive	16	25	0.0000	0.0000	0.0000	0.0000	0.0000
All Terrain Vehicles (ATVs) Inactive	26	50	0.0000	0.0000	0.0000	0.0000	0.0000
Asphalt Pavers	0	15	3.3299	0.0648	0.0471	0.0002	0.0876
Asphalt Pavers	16	25	8.6399	0.1463	0.1152	0.0003	0.2262
Asphalt Pavers	26	50	4.9818	0.3036	0.0028	0.0004	0.2002
Asphalt Pavers	51	120	4.1659	0.8164	0.0053	0.0007	0.2567
Balers	0	50	3.4733	0.2547	0.0025	0.0004	0.1301
Balers	51	120	2.7503	0.6681	0.0047	0.0006	0.1584

Table 2
Four-stroke Gasoline Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Bore/Drill Rigs	0	15	4.6269	0.0781	0.0626	0.0002	0.1295
Bore/Drill Rigs	16	25	8.6949	0.1288	0.1127	0.0003	0.2344
Bore/Drill Rigs	26	50	4.7272	0.3367	0.0033	0.0005	0.1788
Bore/Drill Rigs	51	120	5.6298	1.3245	0.0092	0.0011	0.3276
Bore/Drill Rigs	121	175	5.1862	2.0857	0.0132	0.0016	0.2637
Cement and Mortar Mixers	0	5	1.1945	0.0284	0.0009	0.0001	0.0632
Cement and Mortar Mixers	6	15	3.1831	0.0409	0.0351	0.0001	0.1163
Cement and Mortar Mixers	16	25	9.9305	0.1139	0.1098	0.0004	0.3320
Chippers/Stump Grinders	0	15	4.9114	0.0981	0.0681	0.0002	0.1337
Chippers/Stump Grinders	0	15	5.6885	0.0654	0.0542	0.0002	0.1435
Chippers/Stump Grinders	16	25	8.5306	0.1484	0.1114	0.0003	0.2310
Chippers/Stump Grinders	16	25	9.5378	0.0972	0.0886	0.0003	0.2233
Combines	0	120	4.6027	0.9569	0.0101	0.0013	0.2380
Combines	121	175	6.4133	1.6750	0.0161	0.0020	0.2189
Combines	176	250	7.5864	1.6899	0.0190	0.0024	0.2102
Commercial Turf Equipment	0	15	3.1104	0.0528	0.0029	0.0001	0.0728
Commercial Turf Equipment	16	25	5.7025	0.0889	0.0050	0.0002	0.1285
Commercial Turf Equipment	26	50	4.2027	0.1714	0.0019	0.0003	0.1216
Commercial Turf Equipment	51	120	1.1851	0.1321	0.0035	0.0004	0.0228
Concrete/Industrial Saws	0	5	1.2299	0.0305	0.0010	0.0001	0.0681
Concrete/Industrial Saws	6	15	3.9302	0.0757	0.0557	0.0002	0.1024
Concrete/Industrial Saws	16	25	7.8796	0.1322	0.1052	0.0003	0.2044
Concrete/Industrial Saws	26	50	3.9215	0.0866	0.0036	0.0006	0.0581
Concrete/Industrial Saws	51	120	1.8648	0.0986	0.0068	0.0008	0.0417
Cranes	0	50	4.1598	0.2435	0.0023	0.0004	0.1658
Cranes	51	120	3.6047	0.6824	0.0046	0.0006	0.2221
Cranes	121	175	3.3817	1.2901	0.0078	0.0010	0.1758
Crushing/Proc. Equipment	0	15	4.2829	0.0821	0.0607	0.0002	0.1110
Crushing/Proc. Equipment	16	25	8.0817	0.1349	0.1079	0.0003	0.2084
Crushing/Proc. Equipment	26	120	7.4068	1.5743	0.0108	0.0013	0.4437
Dumpers/Tenders	0	5	0.5711	0.0173	0.0005	0.0001	0.0386
Dumpers/Tenders	6	15	2.4753	0.0330	0.0279	0.0001	0.0910

Table 2
Four-stroke Gasoline Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Dumpers/Tenders	16	25	5.2228	0.0622	0.0589	0.0002	0.1762
Dumpers/Tenders	26	120	2.2309	0.5165	0.0036	0.0004	0.1304
Forklifts	0	25	4.1324	0.0581	0.0037	0.0002	0.0779
Forklifts	26	50	5.8055	0.1522	0.0016	0.0003	0.0895
Forklifts	51	120	2.9526	0.2374	0.0028	0.0003	0.0834
Forklifts	121	175	3.0373	0.4789	0.0058	0.0007	0.0927
Front Mowers	0	15	3.0578	0.0352	0.0024	0.0001	0.0490
Front Mowers	0	15	3.2267	0.0398	0.0021	0.0001	0.0697
Front Mowers	16	25	4.2443	0.0466	0.0031	0.0002	0.0637
Front Mowers	16	25	4.4049	0.0474	0.0027	0.0002	0.0902
Generator Sets	0	5	1.4564	0.0223	0.0089	0.0001	0.1138
Generator Sets	0	5	1.5828	0.0217	0.0087	0.0001	0.1232
Generator Sets	6	15	3.7556	0.0550	0.0030	0.0002	0.1139
Generator Sets	6	15	4.0285	0.0514	0.0030	0.0002	0.1414
Generator Sets	16	25	8.1395	0.1064	0.0064	0.0003	0.2302
Generator Sets	16	25	8.5354	0.0977	0.0064	0.0003	0.2736
Generator Sets	26	50	3.9037	0.2557	0.0029	0.0005	0.1314
Generator Sets	51	120	4.2493	0.9292	0.0075	0.0009	0.2219
Generator Sets	121	175	5.0697	1.7704	0.0131	0.0016	0.2217
Golf Carts	0	15	3.3173	0.0288	0.0022	0.0001	0.1525
Hydro Power Units	0	5	1.0009	0.0291	0.0009	0.0001	0.0649
Hydro Power Units	6	15	2.5135	0.0501	0.0356	0.0001	0.0678
Hydro Power Units	16	25	5.6692	0.0984	0.0756	0.0002	0.1522
Hydro Power Units	26	50	3.5782	0.1118	0.0028	0.0004	0.0650
Hydro Power Units	51	120	1.3331	0.0820	0.0049	0.0006	0.0301
Lawn & Garden Tractors	0	15	3.6950	0.0360	0.0025	0.0002	0.0496
Lawn & Garden Tractors	0	15	3.8658	0.0455	0.0023	0.0002	0.0725
Lawn & Garden Tractors	16	25	6.0613	0.0541	0.0038	0.0002	0.0780
Lawn & Garden Tractors	16	25	6.2715	0.0639	0.0035	0.0002	0.1130
Lawn & Garden Tractors	26	50	2.5453	0.1589	0.0020	0.0003	0.0801
Lawn Mowers	0	5	0.5190	0.0071	0.0043	0.0000	0.0281
Lawn Mowers	0	5	0.8640	0.0089	0.0032	0.0000	0.0364

Table 2
Four-stroke Gasoline Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Leaf Blowers/Vacuums	0	5	0.3524	0.0025	0.0016	0.0000	0.0098
Leaf Blowers/Vacuums	0	5	0.5022	0.0038	0.0013	0.0000	0.0181
Minibikes	0	5	1.9419	0.0074	0.0081	0.0001	0.3032
Off-Road Motorcycles Active	0	15	0.0615	0.0012	0.0001	0.0002	0.0027
Off-Road Motorcycles Active	16	25	0.0615	0.0012	0.0001	0.0004	0.0027
Off-Road Motorcycles Active	26	50	0.0615	0.0012	0.0001	0.0006	0.0027
Off-Road Motorcycles Inactive	0	15	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road Motorcycles Inactive	16	25	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road Motorcycles Inactive	26	50	0.0000	0.0000	0.0000	0.0000	0.0000
Other Agricultural Equipment	0	5	0.8254	0.0222	0.0007	0.0001	0.0496
Other Agricultural Equipment	6	15	3.4488	0.0522	0.0428	0.0001	0.1126
Other Agricultural Equipment	16	25	8.8015	0.1181	0.1070	0.0003	0.2688
Other Agricultural Equipment	26	50	3.0810	0.2209	0.0021	0.0003	0.1181
Other Agricultural Equipment	51	120	3.1252	0.7297	0.0049	0.0006	0.1829
Other Agricultural Equipment	121	175	3.9378	1.6293	0.0099	0.0012	0.2079
Other Agricultural Equipment	176	250	7.1227	2.5272	0.0179	0.0022	0.3241
Other Construction Equipment	0	175	3.3191	0.4393	0.0080	0.0010	0.0680
Other General Industrial Equipmen	0	15	2.4210	0.0336	0.0022	0.0001	0.0468
Other General Industrial Equipmen	16	25	5.7862	0.0857	0.0050	0.0002	0.1213
Other General Industrial Equipmen	26	50	4.1045	0.1325	0.0021	0.0003	0.0713
Other General Industrial Equipmen	51	120	3.3133	0.3761	0.0056	0.0007	0.0998
Other General Industrial Equipmen	121	175	5.4815	0.8421	0.0124	0.0016	0.1265
Other Lawn & Garden Equipment	0	5	1.0328	0.0105	0.0058	0.0001	0.0370
Other Lawn & Garden Equipment	0	5	1.6185	0.0123	0.0043	0.0001	0.0569
Other Lawn & Garden Equipment	6	15	2.5977	0.0307	0.0017	0.0001	0.0418
Other Lawn & Garden Equipment	6	15	2.8962	0.0316	0.0015	0.0001	0.0540
Other Lawn & Garden Equipment	16	25	5.8592	0.0615	0.0037	0.0002	0.0926
Other Lawn & Garden Equipment	16	25	6.3934	0.0604	0.0032	0.0002	0.1139
Other Lawn & Garden Equipment	26	50	3.4389	0.2344	0.0028	0.0004	0.1143
Other Lawn & Garden Equipment	51	120	4.0905	0.9349	0.0078	0.0010	0.2092
Other Material Handling Equipment	0	50	5.1605	0.2737	0.0029	0.0005	0.1739
Other Material Handling Equipment	51	120	2.7333	0.4905	0.0038	0.0005	0.1502

Table 2
Four-stroke Gasoline Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Paving Equipment	0	5	0.8499	0.0244	0.0007	0.0001	0.0545
Paving Equipment	6	15	3.4006	0.0615	0.0468	0.0002	0.0946
Paving Equipment	16	25	7.8563	0.1245	0.1030	0.0003	0.2130
Paving Equipment	26	50	4.0778	0.2641	0.0029	0.0005	0.1468
Paving Equipment	51	120	3.0318	0.6568	0.0052	0.0006	0.1716
Plate Compactors	0	5	0.7821	0.0229	0.0007	0.0001	0.0512
Plate Compactors	6	15	2.5361	0.0460	0.0349	0.0001	0.0707
Pressure Washers	0	5	1.8416	0.0356	0.0137	0.0001	0.1374
Pressure Washers	0	5	2.3900	0.0341	0.0136	0.0001	0.1837
Pressure Washers	6	15	3.6513	0.0535	0.0029	0.0002	0.1107
Pressure Washers	6	15	3.9166	0.0500	0.0029	0.0002	0.1375
Pressure Washers	16	25	9.4900	0.1292	0.0075	0.0004	0.2562
Pressure Washers	16	25	10.0868	0.1154	0.0075	0.0004	0.3167
Pressure Washers	26	50	4.2962	0.2896	0.0033	0.0005	0.1540
Pumps	0	5	0.8251	0.0219	0.0032	0.0001	0.0678
Pumps	0	5	1.1179	0.0198	0.0060	0.0001	0.0909
Pumps	6	15	3.2314	0.0581	0.0437	0.0001	0.0950
Pumps	6	15	3.5049	0.0530	0.0421	0.0001	0.1178
Pumps	16	25	7.0334	0.1163	0.0931	0.0003	0.1885
Pumps	16	25	7.3296	0.1068	0.0921	0.0003	0.2146
Pumps	26	50	4.0636	0.2556	0.0028	0.0004	0.1478
Pumps	51	120	5.0559	1.0641	0.0085	0.0011	0.2905
Pumps	121	175	5.3072	1.8214	0.0131	0.0016	0.2395
Rear Engine Riding Mowers	0	15	1.9153	0.0221	0.0015	0.0001	0.0307
Rear Engine Riding Mowers	0	15	2.0211	0.0250	0.0013	0.0001	0.0436
Rear Engine Riding Mowers	16	25	3.8400	0.0421	0.0028	0.0002	0.0576
Rear Engine Riding Mowers	16	25	3.9854	0.0429	0.0024	0.0002	0.0816
Rollers	0	5	1.3007	0.0290	0.0010	0.0001	0.0648
Rollers	6	15	3.1240	0.0602	0.0443	0.0002	0.0814
Rollers	16	25	7.0002	0.1175	0.0935	0.0003	0.1815
Rollers	26	50	6.2953	0.3318	0.0030	0.0005	0.2567
Rollers	51	120	5.5301	0.9304	0.0062	0.0008	0.3494

Table 2
Four-stroke Gasoline Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Rough Terrain Forklifts	0	50	7.0727	0.4144	0.0039	0.0006	0.2818
Rough Terrain Forklifts	51	120	5.5421	1.0505	0.0071	0.0009	0.3414
Rough Terrain Forklifts	121	175	5.1461	1.9638	0.0118	0.0015	0.2675
Rubber Tired Loaders	0	50	5.5312	0.3128	0.0029	0.0005	0.2246
Rubber Tired Loaders	51	120	4.3445	0.7869	0.0051	0.0006	0.2717
Sailboat Auxiliary Inboard Engine	0	15	1.2909	0.0387	0.0005	0.0001	0.0483
Shredders	0	5	1.2393	0.0317	0.0010	0.0001	0.0707
Shredders	0	5	2.3397	0.0193	0.0078	0.0001	0.0818
Signal Boards	0	5	1.4979	0.0372	0.0012	0.0001	0.0830
Signal Boards	6	15	3.4039	0.0651	0.0483	0.0002	0.0881
Skid Steer Loaders	0	15	4.5549	0.0886	0.0644	0.0002	0.1208
Skid Steer Loaders	16	25	6.5567	0.1111	0.0875	0.0003	0.1728
Skid Steer Loaders	26	50	3.1617	0.1391	0.0025	0.0004	0.0803
Skid Steer Loaders	51	120	2.6452	0.4231	0.0061	0.0008	0.1160
Specialty Vehicles Carts	0	5	1.4038	0.0102	0.0065	0.0001	0.0402
Specialty Vehicles Carts	6	15	2.2730	0.0227	0.0014	0.0001	0.0310
Specialty Vehicles Carts	16	25	6.5485	0.0584	0.0039	0.0003	0.0868
Sprayers	0	5	0.7459	0.0203	0.0006	0.0001	0.0452
Sprayers	6	15	2.4019	0.0308	0.0248	0.0001	0.0900
Sprayers	16	25	5.8115	0.0669	0.0601	0.0002	0.1990
Sprayers	26	50	3.0104	0.2188	0.0022	0.0003	0.1131
Sprayers	51	120	2.6863	0.6461	0.0045	0.0006	0.1553
Sprayers	121	175	3.6141	1.4606	0.0093	0.0012	0.1833
Surfacing Equipment	0	5	0.8482	0.0259	0.0008	0.0001	0.0578
Surfacing Equipment	6	15	2.2001	0.0444	0.0311	0.0001	0.0602
Surfacing Equipment	16	25	5.5461	0.0976	0.0739	0.0002	0.1509
Swathers	0	120	3.6656	0.8708	0.0061	0.0008	0.2127
Swathers	121	175	3.4809	1.4029	0.0089	0.0011	0.1768
Sweepers/Scrubbers	0	15	3.1800	0.0423	0.0027	0.0002	0.0588
Sweepers/Scrubbers	16	25	7.5944	0.1072	0.0063	0.0003	0.1537
Sweepers/Scrubbers	26	50	4.8994	0.1568	0.0033	0.0005	0.0801
Sweepers/Scrubbers	51	120	2.7439	0.3347	0.0064	0.0008	0.0749

Table 2
Four-stroke Gasoline Off-road Equipment Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Sweepers/Scrubbers	121	175	5.5636	0.7241	0.0131	0.0016	0.0983
Tampers/Rammers	0	15	2.8991	0.0508	0.0392	0.0001	0.0836
Tillers	0	5	0.7109	0.0088	0.0040	0.0001	0.0266
Tillers	0	5	0.9842	0.0099	0.0037	0.0001	0.0448
Tillers	6	15	3.3032	0.0421	0.0024	0.0001	0.1154
Tractors/Loaders/Backhoes	0	120	3.3234	0.4757	0.0040	0.0005	0.1872
Transport Refrigeration Units	0	15	3.3745	0.0491	0.0032	0.0002	0.0687
Trenchers	0	15	3.7017	0.0730	0.0524	0.0002	0.0988
Trenchers	16	25	8.2510	0.1417	0.1100	0.0003	0.2191
Trenchers	26	50	4.6921	0.2766	0.0026	0.0004	0.1867
Trenchers	51	120	4.4725	0.8536	0.0058	0.0007	0.2751
Trimmers/Edgers/Brush Cutters	0	5	0.1394	0.0036	0.0001	0.0000	0.0080
Trimmers/Edgers/Brush Cutters	0	5	0.2330	0.0027	0.0010	0.0000	0.0130
Vessels w/Inboard Engines	0	250	13.9180	0.6382	0.0081	0.0010	0.4953
Vessels w/Inboard Jet Engines	0	500	16.7660	0.7496	0.0096	0.0012	0.6019
Vessels w/Outboard Engines	0	50	4.1188	0.1264	0.0018	0.0002	0.1570
Vessels w/Sterndrive Engines	0	250	10.3573	0.4595	0.0060	0.0007	0.3667
Welders	0	15	3.6411	0.0533	0.0421	0.0002	0.1273
Welders	16	25	5.5121	0.0780	0.0672	0.0002	0.1687
Welders	26	50	4.4535	0.2947	0.0030	0.0005	0.1710
Welders	51	120	2.9624	0.6461	0.0047	0.0006	0.1766
Welders	121	175	3.4858	1.3272	0.0088	0.0011	0.1723
Wood Splitters	0	5	1.3665	0.0160	0.0096	0.0001	0.0619
Wood Splitters	0	5	2.4094	0.0176	0.0058	0.0001	0.0725

[a] These are composite horsepower-based off-road emission factors for 2009 developed by running CARB's OFFROAD2007 Model (December 15, 2006 version).
Total daily emissions from the model for each type of equipment within each horsepower range were divided by the total daily operating hours for the equipment within each horsepower range to calculate hourly emissions from individual pieces of equipment.

Table 3
Diesel Off-road 2006 Model Year Scraper Emission Factors for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Emission Factor (lb/hr)				
	From	To	CO	NOx	PM10	SOx	VOC
Scrapers	0	175	0.8129	1.1883	0.0481	0.0017	0.0987
Scrapers	176	250	0.3935	1.6646	0.0428	0.0024	0.1179
Scrapers	251	500	0.5818	1.4146	0.0649	0.0031	0.1711
Scrapers	501	750	1.0062	2.4463	0.1123	0.0056	0.2959

[a] These are composite horsepower-based off-road emission factors for 2006 model year during 2008 developed by running CARB's OFFROAD2007 Model December 15, 2006 version) and specifying output by model year.
Total daily emissions from the model for each type of equipment within each horsepower range were divided by the total daily operating hours for the equipment within each horsepower range to calculate hourly emissions from individual pieces of equipment.

Table 4
Construction Equipment Exhaust Emission Factors

Equipment Type	Fuel	Horsepower	ARB Off-Road Model Category	CO (lb/hr)[a]	VOC (lb/hr)[a]	NO_X (lb/hr)[a]	SO_X (lb/hr)[a]	PM10 (lb/hr)[a]	PM2.5 (lb/hr)[b]
Air Compressor, Ingersoll-Rand	Diesel	80	Air Compressors	0.330	0.099	0.595	0.001	0.053	0.048
Asphalt Paver, Cat A-8008	Diesel	102	Pavers	0.528	0.173	1.014	0.001	0.089	0.082
Backhoe	Diesel	48	Tractors/Loaders/Backhoes	0.369	0.140	0.316	0.000	0.034	0.031
Backhoe, Cat, 420E	Diesel	89	Tractors/Loaders/Backhoes	0.366	0.100	0.608	0.001	0.056	0.051
Compactor, Cat CS-563	Diesel	145	Rollers	0.629	0.157	1.271	0.001	0.069	0.063
Compressor, 250 cfm	Diesel	80	Air Compressors	0.330	0.099	0.595	0.001	0.053	0.048
Crane, 150-Ton, Manitowoc	Diesel	250	Cranes	0.364	0.131	1.311	0.001	0.050	0.046
Crane, 20-Ton, TR400	Diesel	185	Cranes	0.364	0.131	1.311	0.001	0.050	0.046
Crane, 225-Ton, Manitowoc, 4100W	Diesel	350	Cranes	0.710	0.191	1.873	0.002	0.072	0.066
Crane, 40-Ton, Grove, TR700B	Diesel	220	Cranes	0.364	0.131	1.311	0.001	0.050	0.046
Crane, 5 ton	Diesel	62	Cranes	0.376	0.119	0.690	0.001	0.064	0.058
Dozer	Diesel	200	Crawler Tractors	0.599	0.214	2.052	0.002	0.082	0.076
Scraper, CAT 657G, Tractor Engine	Diesel	564	Scrapers	1.006	0.296	2.446	0.006	0.112	0.103
Scraper, CAT 657G, Scraper Engine	Diesel	410	Scrapers	0.582	0.171	1.415	0.003	0.065	0.060
Loader, Cat, 938F	Diesel	140	Rubber Tired Loaders	0.635	0.157	1.228	0.001	0.070	0.065
Motor Grader, Cat 135H	Diesel	135	Graders	0.744	0.186	1.443	0.001	0.083	0.076
Pipelayer, Cat 561N	Diesel	123	Cranes	0.490	0.128	0.986	0.001	0.057	0.052
Roller, 5 ton	Diesel	70	Rollers	0.422	0.128	0.777	0.001	0.067	0.062
Tractor/Loader/Backhoe	Diesel	80	Tractors/Loaders/Backhoes	0.366	0.100	0.608	0.001	0.056	0.051
Trencher, Cat 140G	Diesel	54	Trenchers	0.489	0.159	0.949	0.001	0.081	0.074
Truck, Concrete Pump, International	Diesel	190	Off-Highway Trucks	0.452	0.172	1.737	0.002	0.061	0.056
Vibratory Compactor	Diesel	70	Rollers	0.422	0.128	0.777	0.001	0.067	0.062
Welder	Diesel	35	Welders	0.291	0.117	0.269	0.000	0.028	0.026
Welder, Multiquip, BLW-300SS	Diesel	23	Welders	0.065	0.025	0.109	0.000	0.008	0.007
Welder, Multiquip, GA 3800	Gasoline	7.5	Welders	3.641	0.127	0.053	0.000	0.042	0.032
On-Site Watering Truck	Diesel	250	Off-Highway Trucks	0.452	0.172	1.737	0.002	0.061	0.056
Backhoe, w/Bucket	Diesel	85	Tractors/Loaders/Backhoes	0.366	0.100	0.608	0.001	0.056	0.051
Compressor	Gasoline	20	Air Compressors	5.714	0.156	0.096	0.000	0.076	0.057
Concrete Pumper	Diesel	85	Other Construction Equipment	0.547	0.145	0.925	0.001	0.079	0.073
Crane, Hydraulic, 150 Ton	Diesel	250	Cranes	0.364	0.131	1.311	0.001	0.050	0.046
Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	125	Cranes	0.490	0.128	0.986	0.001	0.057	0.052
Crane, Hydraulic, Rough Terrain, 35 Ton	Diesel	150	Cranes	0.490	0.128	0.986	0.001	0.057	0.052
Crawler, Track Type, Drill Rig, Pneumatic	Diesel	305	Crawler Tractors	1.279	0.302	2.864	0.003	0.115	0.106
Crawler, Track Type, Sagging (D8 type)	Diesel	305	Crawler Tractors	1.279	0.302	2.864	0.003	0.115	0.106
Crawler, Track Type, w/ Blade (D6 type)	Diesel	165	Crawler Tractors	0.765	0.205	1.563	0.001	0.090	0.083
Crawler, Track Type, w/ Blade (D8 type)	Diesel	305	Crawler Tractors	1.279	0.302	2.864	0.003	0.115	0.106
Digger, Transmission Type, Truck Mount	Diesel	190	Trenchers	0.850	0.290	2.807	0.003	0.115	0.106

Table 4
Construction Equipment Exhaust Emission Factors

Equipment Type	Fuel	Horsepower	ARB Off-Road Model Category	CO (lb/hr)[a]	VOC (lb/hr)[a]	NO_X (lb/hr)[a]	SO_X (lb/hr)[a]	PM10 (lb/hr)[a]	PM2.5 (lb/hr)[b]
Drill Rig, Truck Mount	Diesel	190	Bore/Drill Rigs	0.348	0.100	1.315	0.002	0.040	0.036
Forklift, 10 Ton	Diesel	85	Forklifts	1.087	0.346	3.541	0.004	0.127	0.117
Forklift, 5 Ton	Diesel	75	Forklifts	1.087	0.346	3.541	0.004	0.127	0.117
Loader, Front End, w/ Bucket	Diesel	145	Rubber Tired Loaders	0.635	0.157	1.228	0.001	0.070	0.065
Motor Grader	Diesel	110	Graders	0.552	0.167	0.982	0.001	0.090	0.083
Generator	Gasoline	5	Generator Sets	1.583	0.123	0.022	0.000	0.009	0.007
Tension Machine	Diesel	135	Other Construction Equipment	0.591	0.126	1.069	0.001	0.058	0.053
Truck, Flatbed w/Boom, 5 Ton	Diesel	235	Cranes	0.364	0.131	1.311	0.001	0.050	0.046
Truck, Boom	Diesel	310	Cranes	0.710	0.191	1.873	0.002	0.072	0.066
Truck, Flatbed, w/ Bucket, 5 Ton	Diesel	235	Cranes	0.364	0.131	1.311	0.001	0.050	0.046
Truck, Manlift	Diesel	235	Cranes	0.364	0.131	1.311	0.001	0.050	0.046
Truck, Wire Puller, 1 Drum	Diesel	310	Other Construction Equipment	0.650	0.181	2.121	0.002	0.072	0.066
Truck, Wire Puller, 1 Drum (OVHD Gr. Wr.)	Diesel	310	Other Construction Equipment	0.650	0.181	2.121	0.002	0.072	0.066
Truck, Wire Puller, 3 Drum	Diesel	310	Other Construction Equipment	0.650	0.181	2.121	0.002	0.072	0.066

[a] From Table 1 for diesel and Table 2 for gasoline for all except scrapers. Scrapers are from Table 3 and are for 2006 model year.

[b] Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction of PM10 in Diesel Engine Exhaust = 0.920 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5
PM2.5 Fraction of PM10 in Gasoline Engine Exhaust = 0.756 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Emission factor [pounds per hour] x Number pieces of equipment x Operating time for each piece [hours per day]

Table 5-A
Antelope Valley AQMD Jurisdiction 2009 On-Road Motor Vehicle Emission Factors

Vehicle Class	Emission Factors[a]												
	CO (lb/mi)	VOC (lb/mi)	NO_x (lb/mi)	SO_x (lb/mi)	PM10 Exh (lb/mi)	PM10 Tire (lb/mi)	PM10 Brake (lb/mi)	PM10 Tire + Brake (lb/mi)	Diesel PM (lb/mi)	PM2.5 Exh (lb/mi)	PM2.5 Tire (lb/mi)	PM2.5 Brake (lb/mi)	PM2.5 Tire + Brake (lb/mi)
LDA-NCAT	1.74E-01	2.84E-02	1.10E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDA-CAT	7.15E-03	7.54E-04	6.39E-04	5.46E-06	2.19E-05	1.64E-05	2.73E-05	4.37E-05	0.00E+00	2.03E-05	4.10E-06	1.17E-05	1.58E-05
LDA-DSL	2.50E-03	0.00E+00	2.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT1-NCAT	1.70E-01	2.18E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT1-CAT	8.72E-03	8.01E-04	7.40E-04	0.00E+00	3.08E-05	3.08E-05	3.08E-05	6.16E-05	0.00E+00	2.86E-05	7.70E-06	1.32E-05	2.09E-05
LDT1-DSL	1.33E-03	0.00E+00	3.56E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT2-NCAT	1.70E-01	2.17E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT2-CAT	9.81E-03	9.92E-04	1.29E-03	1.18E-05	4.73E-05	1.18E-05	2.36E-05	3.54E-05	0.00E+00	4.39E-05	2.95E-06	1.01E-05	1.31E-05
LDT2-DSL	0.00E+00	0.00E+00	5.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MDV-NCAT	3.15E-01	2.00E-02	1.75E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MDV-CAT	9.97E-03	9.70E-04	1.42E-03	2.06E-05	4.13E-05	2.06E-05	2.06E-05	4.13E-05	0.00E+00	3.83E-05	5.16E-06	8.85E-06	1.40E-05
MDV-DSL	0.00E+00	0.00E+00	5.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHDT1-NCAT	2.40E-01	2.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHDT1-CAT	2.05E-02	2.48E-03	4.60E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHDT1-DSL	1.67E-03	4.17E-04	1.13E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHDT2-CAT	1.44E-02	1.60E-03	4.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHDT2-DSL	1.33E-03	6.67E-04	1.33E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MHDT-CAT	6.60E-02	4.00E-03	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MHDT-DSL	3.85E-03	3.85E-04	2.12E-02	0.00E+00	3.85E-04	0.00E+00	0.00E+00	0.00E+00	3.85E-04	3.54E-04	0.00E+00	0.00E+00	0.00E+00
HHDT-CAT	1.17E-01	6.67E-03	3.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HHDT-DSL	1.04E-02	2.49E-03	3.70E-02	7.33E-05	1.54E-03	7.33E-05	7.33E-05	1.47E-04	1.54E-03	1.42E-03	1.83E-05	3.14E-05	4.97E-05
OBUS-CAT	7.50E-02	5.00E-03	1.50E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OBUS-DSL	5.00E-03	0.00E+00	2.50E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SBUS-CAT	7.00E-02	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SBUS-DSL	9.33E-03	1.33E-03	3.07E-02	0.00E+00	1.33E-03	0.00E+00	0.00E+00	0.00E+00	1.33E-03	1.23E-03	0.00E+00	0.00E+00	0.00E+00
UB-CAT	4.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
UB-DSL	2.86E-03	0.00E+00	1.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MH-NCAT	2.60E-01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MH-CAT	2.14E-02	4.55E-04	3.64E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MH-DSL	0.00E+00	0.00E+00	2.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MCY-NCAT	1.31E-01	1.23E-02	3.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MCY-CAT	4.58E-02	9.03E-03	2.58E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[a] Emission factors, except PM2.5, calculated by dividing total emissions [lb/day] from BURDEN output of EMFAC2007, version 2.3, by total VMT [mi/day] from BURDEN output. PM10 emission factors by mass fractions in table below.

Table 5-B
PM2.5 Mass Fractions of PM10

PM10 Category	Tech.	PM2.5 Fraction[a]
Exhaust	CAT	0.928
Exhaust	NCAT	0.756
Exhaust	DSL	0.920
Tire Wear	N/A	0.250
Brake Wear	N/A	0.429

[a] From Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Table 6-A
2009 Motor Vehicle Emission Factors

Vehicle Type	Vehicle Class	Emission Factors								
		CO (lb/mi)	VOC (lb/mi)	NO_x (lb/mi)	SO_x (lb/mi)	Exh. PM10 (lb/mi)	Fug. PM10 (lb/mi)	Diesel PM (lb/mi)	Exh. PM2.5 (lb/mi)	Fug. PM2.5 (lb/mi)
On-Site Welding Truck	MDV-CAT	0.00997	0.00097	0.00142	0.00002	0.00004	1.04234	0.00000	0.00004	0.22098
On-Site Fuel/Lube Truck	MDV-CAT	0.00997	0.00097	0.00142	0.00002	0.00004	1.04234	0.00000	0.00004	0.22098
On-Site Flatbed Truck	MHDT-CAT	0.06600	0.00400	0.01000	0.00000	0.00000	1.04229	0.00000	0.00000	0.22097
On-Site Flatbed Truck, 2 Ton	MHDT-CAT	0.06600	0.00400	0.01000	0.00000	0.00000	1.04229	0.00000	0.00000	0.22097
On-Site Flatbed Truck, 5 Ton	MHDT-CAT	0.06600	0.00400	0.01000	0.00000	0.00000	1.04229	0.00000	0.00000	0.22097
On-Site Mechanics Truck	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	1.04244	0.00154	0.00142	0.22102
On-Site Watering Truck	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	0.00015	0.00154	0.00142	0.00005
On-Site Dump Truck	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	1.04244	0.00154	0.00142	0.22102
On-Site Pickup Truck	LDT1-CAT	0.00872	0.00080	0.00074	0.00000	0.00003	1.04236	0.00000	0.00003	0.22099
On-Site Cement Trucks	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	1.04244	0.00154	0.00142	0.22102
On-Site Semi Tractor	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	1.04244	0.00154	0.00142	0.22102
Off-Site Flat Bed Trucks	MDV-CAT	0.00997	0.00097	0.00142	0.00002	0.00004	0.00090	0.00000	0.00004	0.00016
Off-Site Asphalt Trucks	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	0.00100	0.00154	0.00142	0.00019
Off-Site Cement Trucks	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	0.00100	0.00154	0.00142	0.00019
Off-Site Construction Worker Commute	LDT1-CAT	0.00872	0.00080	0.00074	0.00000	0.00003	0.00092	0.00000	0.00003	0.00017
Off-Site Dump Trucks	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	0.00100	0.00154	0.00142	0.00019
Off-Site Low Boy Trucks	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	0.00100	0.00154	0.00142	0.00019
Off-Site Pickup Trucks	LDT1-CAT	0.00872	0.00080	0.00074	0.00000	0.00003	0.00092	0.00000	0.00003	0.00017
Off-Site Pipe Hauling Trucks	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	0.00100	0.00154	0.00142	0.00019
Off-Site Water Trucks	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	0.00100	0.00154	0.00142	0.00019
Off-Site Tractor-Trailer	HHDT-DSL	0.01040	0.00249	0.03700	0.00007	0.00154	0.00100	0.00154	0.00142	0.00019
Off-Site Fuel/Lube Trucks	MDV-CAT	0.00997	0.00097	0.00142	0.00002	0.00004	0.00090	0.00000	0.00004	0.00016

Note: The emission factors, except fugitive emissions from entrained road dust, were compiled by running the California Air Resources Board's EMFAC2007
(version 2.3) Burden Model and dividing calculated daily emissions by daily vehicle-miles-traveled.
Welding trucks, fuel/lube trucks and flatbed trucks are assumed to be Medium-Duty Catalyst Equipped Vehicles.
Pickup trucks and construction worker commuting vehicles are assumed to be Light-Duty Trucks 1.
All other vehicles are assumed to be heavy heavy-duty diesel vehicles.
All the emission factors account for the emissions from start, running and idling exhaust. In addition, the VOC
emission factors take into account diurnal, hot soak, running and resting emissions, and fugitive PM10 and PM2.5 emission factors
take into account tire and brake wear and entrained paved or unpaved road dust, except for water trucks. Entrained unpaved road dust emissions.
from water trucks are assumed to be zero, because water trucks will be equipped with front spray bars, which will eliminate entrained dust emissions.

Emissions [pounds/day] = Emission factor [pounds/mile] x Vehicle miles traveled [miles/day]

Table 6-B
Motor Vehicle Entrained Paved Road PM10 Emission Factors

Vehicle Type	On-Road Average Vehicle Weight (tons)[a]	Road Type	Silt Loading (g/m2)[b]	PM10 Emission Factor (lb/mi)[c]	PM2.5 Emission Factor (lb/mi)[d]
Off-Site Flat Bed Trucks	2.4	Collector	0.037	0.0009	0.0001
Off-Site Asphalt Trucks	2.4	Collector	0.037	0.0009	0.0001
Off-Site Cement Trucks	2.4	Collector	0.037	0.0009	0.0001
Off-Site Construction Worker Commute	2.4	Collector	0.037	0.0009	0.0001
Off-Site Dump Trucks	2.4	Collector	0.037	0.0009	0.0001
Off-Site Low Boy Trucks	2.4	Collector	0.037	0.0009	0.0001
Off-Site Pickup Trucks	2.4	Collector	0.037	0.0009	0.0001
Off-Site Pipe Hauling Trucks	2.4	Collector	0.037	0.0009	0.0001
Off-Site Water Trucks	2.4	Collector	0.037	0.0009	0.0001
Off-Site Tractor-Trailer	2.4	Collector	0.037	0.0009	0.0001
Off-Site Fuel/Lube Trucks	2.4	Collector	0.037	0.0009	0.0001

[a] Average on-road vehicle weight in San Bernardino County from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997)

[b] From ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997)

[c] Emission factor [g/mi] = 7.26 (Silt Loading/2)$^{0.65}$ (Weight/3)$^{1.5}$,
from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997)

[d] PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction of PM10 in Paved Road Dust = 0.169 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds/day] = Emission factor [pounds/mile] x Vehicle miles traveled [miles/day]

Table 7
Fugitive Dust PM10 Emission Factors

Soil Dropping During Excavation

Emission Factor [lb/cu. yd] = 0.0011 x (mean wind speed [mi/hr] / 5)$^{1.3}$ / (moisture [%] / 2)$^{1.4}$ x (number drops per ton) x (density [ton/cu. yd])
Reference: AP-42, Equation (1), Section 13.2.4, January 1995

Parameter	Value	Basis
Mean Wind Speed	12	SCAQMD 1993 CEQA Air Quality Handbook, Default
Moisture	15	"Open Fugitive Dust PM10 Control Strategies Study," Midwest Research Institute, October 12, 1990, moist soil.
Number Drops	4	Assumption
Soil Density	1.215	Table 2.46, Handbook of Solid Waste Management

PM10 Emission Factor (Uncontrolled)	9.94E-04	lb/cu. yd
Reduction from Watering Twice/Day	0%	
Controlled PM10 Emission Factor	9.94E-04	lb/cu. yd
Controlled PM2.5 Emission Factor[a]	2.07E-04	lb/cu. yd

[a] PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Controlled emission factor [pounds per cubic yard] x Volume soil handled [cubic yards per day]

Table 7
Fugitive Dust PM10 Emission Factors

Storage Pile Wind Erosion

Emission Factor [lb/day-acre] = 0.85 x (silt content [%] / 1.5) x (365 / 235) x (percentage of time unobstructed wind exceeds 12 mph / 15)
Reference: Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, EPA, September 1992

Parameter	Value	Basis
Silt Content	11	Default conservative silt content from MDAQMD guidance
Pct. time wind > 12 mph	13.3	"Emissions Inventory Guidance, Mineral Handling and Processing Industries," MDAQMD, April 10, 2000, p. 17.

PM10 Emission Factor (Uncontrolled)	8.6	lb/day-acre
Reduction from Watering Twice/Day	50%	
Controlled PM10 Emission Factor	4.3	lb/day-acre
Controlled PM2.5 Emission Factor[a]	0.9	lb/day-acre

[a] PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Controlled emission factor [pounds per acre-day] x Storage pile surface area [acres]

Table 7
Fugitive Dust PM10 Emission Factors

Bulldozing and Grading

Emission Factor [lb/hr] = 0.75 x (silt content [%])$^{1.5}$ / (moisture)$^{1.4}$
Reference: AP-42, Table 11.9-1, July 1998

Parameter	Value	Basis
Silt Content	11	Default conservative silt content from MDAQMD guidance
Moisture	15	SCAQMD 1993 CEQA Air Quality Handbook, Moist Soil

PM10 Emission Factor (Uncontrolled)	0.617	lb/hr
Reduction from Watering Twice/Day	0%	
Controlled PM10 Emission Factor	0.617	lb/hr
Controlled PM2.5 Emission Factor[a]	0.128	lb/hr

[a] PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Controlled emission factor [pounds per hour] x Bulldozing or grading time [hours/day]

Table 7
Fugitive Dust PM10 Emission Factors

Vehicles on Unpaved Surfaces

Emission Factor [lb/mi] = 1.5 x (silt content [%] / 12)$^{0.9}$ x (vehicle weight [tons] / 3)$^{0.45}$
Reference: AP-42, Section 13.2.2, December 2003 for industrial unpaved roads

Parameter	Value	Basis
Silt Content	11	Default conservative silt content from MDAQMD guidance
Vehicle Weight	20	Average of 30 tons loaded and 10 tons empty weights

PM10 Emission Factor (Uncontrolled)	3.257	lb/mi
Reduction from Watering Three Times/Day	68%	from SCAQMD 1993 CEQA Air Quality Handbook, Table 11-4
Controlled PM10 Emission Factor	1.042	lb/mi
Controlled PM2.5 Emission Factor[a]	0.221	lb/mi

[a] PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10
PM2.5 Fraction of PM10 in Unpaved Road Dust = 0.212 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Controlled emission factor [pounds per mile] x Miles traveled [miles/day]

Table 8-A
Combined Cycle Facility Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number													
			Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	4.5	4	4	4	4	4	4	4	5	5	5	5	5	5	5
Asphalt Paver, Cat A-8008	Diesel	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	5	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Compactor, Cat CS-563	Diesel	5	1	1	1	1	1	0	0	0	0	0	0	0	0	0
Crane, 150-Ton, Manitowoc	Diesel	4	0	0	0	0	1	1	2	2	2	2	2	2	1	1
Crane, 20-Ton, TR400	Diesel	5	0	0	0	1	1	1	1	1	2	2	2	2	2	2
Crane, 225-Ton, Manitowoc, 4100W	Diesel	4	0	0	0	0	0	0	0	1	1	1	1	2	2	2
Crane, 40-Ton, Grove, TR700B	Diesel	5	0	0	1	1	1	2	2	2	2	2	2	3	3	4
Loader, Cat, 938F	Diesel	5	1	1	1	1	1	1	1	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trencher, Cat 140G	Diesel	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Truck, Concrete Pump, International	Diesel	4	1	2	2	2	2	2	2	1	1	1	1	1	1	1
Welder, Multiquip, BLW-300SS	Diesel	6	1	1	1	2	3	6	9	9	9	9	9	9	8	7
Welder, Multiquip, GA 3800	Gasoline	6.5	5	5	5	5	7	7	7	7	7	7	8	9	9	9
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	Gasoline	5	2	2	2	2	2	2	2	2	2	2	3	3	3	3
On-Site Fuel/Lube Truck	Gasoline	5	1	1	1	1	1	1	1	1	1	2	2	2	2	2
On-Site Flatbed Truck	Gasoline	5	2	2	2	2	2	2	2	2	3	3	3	3	3	3
On-Site Watering Truck	Diesel	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1
On-Site Dump Truck	Diesel	5	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	20	4	4	4	4	4	9	9	15	15	20	20	20	15	15
Off-Site Asphalt Trucks	Diesel	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Cement Trucks	Diesel	20	0	0	5	5	5	5	5	6	6	3	1	1	1	1
Off-Site Construction Worker Commute	Gasoline	60	129	148	167	185	204	252	263	267	269	272	272	285	272	259
Off-Site Dump Trucks	Diesel	40	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Low Boy Trucks	Diesel	15	0	0	0	0	5	5	5	5	5	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	20	5	5	5	5	5	5	7	12	12	10	10	10	10	10
Off-Site Pipe Hauling Trucks	Diesel	120	0	0	0	0	0	4	4	8	8	8	8	4	4	4
Off-Site Water Trucks	Diesel	5	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Off-Site Fuel/Lube Trucks	Gasoline	20	2	2	2	2	2	3	3	3	3	3	3	3	3	3

Table 8-A (continued)
Combined Cycle Facility Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number												
			Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment															
Air Compressor, Ingersoll-Rand	Diesel	4.5	5	5	5	5	6	6	6	6	6	6	6	6	0
Asphalt Paver, Cat A-8008	Diesel	6	0	0	0	0	0	0	0	2	2	2	2	2	0
Backhoe, Cat, 420E	Diesel	5	1	1	1	1	1	1	1	1	0	0	0	0	0
Compactor, Cat CS-563	Diesel	5	0	0	0	0	0	0	1	1	1	1	1	1	0
Crane, 150-Ton, Manitowoc	Diesel	4	1	1	1	1	1	1	1	1	1	1	0	0	0
Crane, 20-Ton, TR400	Diesel	5	2	2	2	2	2	2	2	2	2	2	2	2	2
Crane, 225-Ton, Manitowoc, 4100W	Diesel	4	2	1	1	1	1	1	1	0	0	0	0	0	0
Crane, 40-Ton, Grove, TR700B	Diesel	5	4	2	2	2	2	2	2	2	2	2	2	2	2
Loader, Cat, 938F	Diesel	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	6	1	1	1	0	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	6	1	1	1	1	1	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	4	1	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	6	6	6	6	6	5	5	5	5	5	5	5	5	5
Welder, Multiquip, GA 3800	Gasoline	6.5	9	9	9	9	9	9	9	8	8	8	8	8	8
Motor Vehicles															
On-site Vehicles															
On-Site Welding Truck	Gasoline	5	3	3	3	3	3	3	3	3	3	3	3	3	3
On-Site Fuel/Lube Truck	Gasoline	5	2	2	2	2	2	2	2	1	1	1	1	1	1
On-Site Flatbed Truck	Gasoline	5	3	3	3	3	3	3	3	3	3	3	3	3	3
On-Site Watering Truck	Diesel	8	1	1	1	1	1	1	1	1	1	1	1	1	1
On-Site Dump Truck	Diesel	5	2	2	2	2	1	1	1	1	1	1	1	1	1
Off-Site Vehicles															
Off-Site Flat Bed Trucks	Gasoline	20	10	10	10	5	5	1	1	1	1	1	1	1	1
Off-Site Asphalt Trucks	Diesel	20	0	0	0	0	0	0	0	2	2	2	2	2	2
Off-Site Cement Trucks	Diesel	20	1	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	60	227	210	184	181	167	166	152	126	118	106	105	104	99
Off-Site Dump Trucks	Diesel	40	2	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Low Boy Trucks	Diesel	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	20	10	5	5	5	5	5	5	5	5	5	3	3	3
Off-Site Pipe Hauling Trucks	Diesel	120	4	4	4	4	1	1	1	0	0	0	0	0	0
Off-Site Water Trucks	Diesel	5	2	2	2	2	2	2	2	1	1	1	1	1	1
Off-Site Fuel/Lube Trucks	Gasoline	20	3	3	2	2	2	2	2	2	2	2	2	2	2

Table 8-B
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	396	396	396	396	396	396	396	495	495	495	495	495	495	495	495
Asphalt Paver, Cat A-8008	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	220	220	220	220	220	220	220	220	220	220	110	110	110	110	110
Compactor, Cat CS-563	Diesel	110	110	110	110	110	0	0	0	0	0	0	0	0	0	0
Crane, 150-Ton, Manitowoc	Diesel	0	0	0	0	88	88	176	176	176	176	176	176	88	88	88
Crane, 20-Ton, TR400	Diesel	0	0	0	110	110	110	110	110	220	220	220	220	220	220	220
Crane, 225-Ton, Manitowoc, 4100W	Diesel	0	0	0	0	0	0	0	88	88	88	88	176	176	176	176
Crane, 40-Ton, Grove, TR700B	Diesel	0	0	110	110	110	220	220	220	220	220	220	330	330	440	440
Loader, Cat, 938F	Diesel	110	110	110	110	110	110	110	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Trencher, Cat 140G	Diesel	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Truck, Concrete Pump, International	Diesel	88	176	176	176	176	176	176	88	88	88	88	88	88	88	88
Welder, Multiquip, BLW-300SS	Diesel	132	132	132	264	396	792	1,188	1,188	1,188	1,188	1,188	1,188	1,056	924	792
Welder, Multiquip, GA 3800	Gasoline	715	715	715	715	1,001	1,001	1,001	1,001	1,001	1,001	1,144	1,287	1,287	1,287	1,287
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	Gasoline	220	220	220	220	220	220	220	220	220	220	330	330	330	330	330
On-Site Fuel/Lube Truck	Gasoline	110	110	110	110	110	110	110	110	110	220	220	220	220	220	220
On-Site Flatbed Truck	Gasoline	220	220	220	220	220	220	220	220	330	330	330	330	330	330	330
On-Site Watering Truck	Diesel	176	176	176	176	176	176	176	176	176	176	176	176	176	176	176
On-Site Dump Truck	Diesel	110	110	110	110	110	220	220	220	220	220	220	220	220	220	220
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	1,760	1,760	1,760	1,760	1,760	3,960	3,960	6,600	6,600	8,800	8,800	8,800	6,600	6,600	4,400
Off-Site Asphalt Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Cement Trucks	Diesel	0	0	2,200	2,200	2,200	2,200	2,200	2,640	2,640	1,320	440	440	440	440	440
Off-Site Construction Worker Commute	Gasoline	170,280	195,360	220,440	244,200	269,280	332,640	347,160	352,440	355,080	359,040	359,040	376,200	359,040	341,880	299,640
Off-Site Dump Trucks	Diesel	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760
Off-Site Low Boy Trucks	Diesel	0	0	0	0	1,650	1,650	1,650	1,650	1,650	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	2,200	2,200	2,200	2,200	2,200	2,200	3,080	5,280	5,280	4,400	4,400	4,400	4,400	4,400	4,400
Off-Site Pipe Hauling Trucks	Diesel	0	0	0	0	0	10,560	10,560	21,120	21,120	21,120	21,120	10,560	10,560	10,560	10,560
Off-Site Water Trucks	Diesel	110	110	110	110	110	110	110	110	220	220	220	220	220	220	220
Off-Site Fuel/Lube Trucks	Gasoline	880	880	880	880	880	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320

Table 8-B (continued)
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	Diesel	495	495	495	594	594	594	594	594	594	594	594	0
Asphalt Paver, Cat A-8008	Diesel	0	0	0	0	0	0	264	264	264	264	264	0
Backhoe, Cat, 420E	Diesel	110	110	110	110	110	110	110	0	0	0	0	0
Compactor, Cat CS-563	Diesel	0	0	0	0	0	110	110	110	110	110	110	0
Crane, 150-Ton, Manitowoc	Diesel	88	88	88	88	88	88	88	88	88	0	0	0
Crane, 20-Ton, TR400	Diesel	220	220	220	220	220	220	220	220	220	220	220	220
Crane, 225-Ton, Manitowoc, 4100W	Diesel	88	88	88	88	88	88	0	0	0	0	0	0
Crane, 40-Ton, Grove, TR700B	Diesel	220	220	220	220	220	220	220	220	220	220	220	220
Loader, Cat, 938F	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	132	132	0	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	132	132	132	132	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	792	792	792	660	660	660	660	660	660	660	660	660
Welder, Multiquip, GA 3800	Gasoline	1,287	1,287	1,287	1,287	1,287	1,287	1,144	1,144	1,144	1,144	1,144	1,144
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	Gasoline	330	330	330	330	330	330	330	330	330	330	330	330
On-Site Fuel/Lube Truck	Gasoline	220	220	220	220	220	220	110	110	110	110	110	110
On-Site Flatbed Truck	Gasoline	330	330	330	330	330	330	330	330	330	330	330	330
On-Site Watering Truck	Diesel	176	176	176	176	176	176	176	176	176	176	176	176
On-Site Dump Truck	Diesel	220	220	220	110	110	110	110	110	110	110	110	110
Off-Site Vehicles													
Off-Site Flat Bed Trucks	Gasoline	4,400	4,400	2,200	2,200	440	440	440	440	440	440	440	440
Off-Site Asphalt Trucks	Diesel	0	0	0	0	0	0	880	880	880	880	880	880
Off-Site Cement Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	277,200	242,880	238,920	220,440	219,120	200,640	166,320	155,760	139,920	138,600	137,280	130,680
Off-Site Dump Trucks	Diesel	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760
Off-Site Low Boy Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	1,320	1,320	1,320
Off-Site Pipe Hauling Trucks	Diesel	10,560	10,560	10,560	2,640	2,640	2,640	0	0	0	0	0	0
Off-Site Water Trucks	Diesel	220	220	220	220	220	220	110	110	110	110	110	110
Off-Site Fuel/Lube Trucks	Gasoline	1,320	880	880	880	880	880	880	880	880	880	880	880

a Based on 22 working days per month

Table 8-C
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.3302	130.8	130.8	130.8	130.8	130.8	130.8	130.8	163.5	163.5	163.5	163.5	163.5	163.5	163.5	163.5
Asphalt Paver, Cat A-8008	0.5282	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.3664	80.6	80.6	80.6	80.6	80.6	80.6	80.6	80.6	80.6	80.6	40.3	40.3	40.3	40.3	40.3
Compactor, Cat CS-563	0.6294	69.2	69.2	69.2	69.2	69.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.3642	0.0	0.0	0.0	0.0	32.1	32.1	64.1	64.1	64.1	64.1	64.1	64.1	32.1	32.1	32.1
Crane, 20-Ton, TR400	0.3642	0.0	0.0	0.0	40.1	40.1	40.1	40.1	40.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1
Crane, 225-Ton, Manitowoc, 4100W	0.7101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.5	62.5	62.5	62.5	125.0	125.0	125.0	125.0
Crane, 40-Ton, Grove, TR700B	0.3642	0.0	0.0	40.1	40.1	40.1	80.1	80.1	80.1	80.1	80.1	80.1	120.2	120.2	160.3	160.3
Loader, Cat, 938F	0.6348	69.8	69.8	69.8	69.8	69.8	69.8	69.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.7439	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2
Trencher, Cat 140G	0.4892	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6
Truck, Concrete Pump, International	0.4516	39.7	79.5	79.5	79.5	79.5	79.5	79.5	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7
Welder, Multiquip, BLW-300SS	0.0651	8.6	8.6	8.6	17.2	25.8	51.6	77.3	77.3	77.3	77.3	77.3	77.3	68.7	60.2	51.6
Welder, Multiquip, GA 3800	3.6411	2,603.4	2,603.4	2,603.4	2,603.4	3,644.7	3,644.7	3,644.7	3,644.7	3,644.7	3,644.7	4,165.4	4,686.1	4,686.1	4,686.1	4,686.1
Construction Equipment Total		**3,164.9**	**3,204.7**	**3,244.7**	**3,293.4**	**4,375.4**	**4,372.0**	**4,429.8**	**4,415.4**	**4,455.5**	**4,455.5**	**4,935.9**	**5,559.1**	**5,518.5**	**5,549.9**	**5,541.3**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.0100	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	3.3	3.3	3.3	3.3	3.3
On-Site Fuel/Lube Truck	0.0100	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	2.2	2.2	2.2	2.2	2.2	2.2
On-Site Flatbed Truck	0.0660	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	21.8	21.8	21.8	21.8	21.8	21.8	21.8
On-Site Watering Truck	0.0104	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
On-Site Dump Truck	0.0104	1.1	1.1	1.1	1.1	1.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0100	17.5	17.5	17.5	17.5	17.5	39.5	39.5	65.8	65.8	87.7	87.7	87.7	65.8	65.8	43.9
Off-Site Asphalt Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0104	0.0	0.0	22.9	22.9	22.9	22.9	22.9	27.5	27.5	13.7	4.6	4.6	4.6	4.6	4.6
Off-Site Construction Worker Commute	0.0087	1,485.0	1,703.8	1,922.5	2,129.7	2,348.4	2,901.0	3,027.6	3,073.7	3,096.7	3,131.2	3,131.2	3,280.9	3,131.2	2,981.6	2,613.2
Off-Site Dump Trucks	0.0104	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
Off-Site Low Boy Trucks	0.0104	0.0	0.0	0.0	0.0	17.2	17.2	17.2	17.2	17.2	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0087	19.2	19.2	19.2	19.2	19.2	19.2	26.9	46.0	46.0	38.4	38.4	38.4	38.4	38.4	38.4
Off-Site Pipe Hauling Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	109.9	109.9	219.7	219.7	219.7	219.7	109.9	109.9	109.9	109.9
Off-Site Water Trucks	0.0104	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Off-Site Fuel/Lube Trucks	0.0100	8.8	8.8	8.8	8.8	8.8	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
On-Site Motor Vehicle Total		**20.8**	**20.8**	**20.8**	**20.8**	**20.8**	**21.9**	**21.9**	**21.9**	**29.2**	**30.3**	**31.4**	**31.4**	**31.4**	**31.4**	**31.4**
Off-Site Motor Vehicle Total		**1,550.0**	**1,768.7**	**2,010.3**	**2,217.5**	**2,453.4**	**3,142.2**	**3,276.5**	**3,482.5**	**3,506.6**	**3,524.5**	**3,515.4**	**3,555.2**	**3,383.6**	**3,233.9**	**2,843.6**

Table 8-C (continued)
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.3302	163.5	163.5	163.5	196.1	196.1	196.1	196.1	196.1	196.1	196.1	196.1	0.0
Asphalt Paver, Cat A-8008	0.5282	0.0	0.0	0.0	0.0	0.0	0.0	139.4	139.4	139.4	139.4	139.4	0.0
Backhoe, Cat, 420E	0.3664	40.3	40.3	40.3	40.3	40.3	40.3	40.3	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.6294	0.0	0.0	0.0	0.0	0.0	69.2	69.2	69.2	69.2	69.2	69.2	0.0
Crane, 150-Ton, Manitowoc	0.3642	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.3642	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1
Crane, 225-Ton, Manitowoc, 4100W	0.7101	62.5	62.5	62.5	62.5	62.5	62.5	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.3642	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1	80.1
Loader, Cat, 938F	0.6348	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.7439	98.2	98.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.4892	64.6	64.6	64.6	64.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.4516	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.0651	51.6	51.6	51.6	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
Welder, Multiquip, GA 3800	3.6411	4,686.1	4,686.1	4,686.1	4,686.1	4,686.1	4,686.1	4,165.4	4,165.4	4,165.4	4,165.4	4,165.4	4,165.4
Construction Equipment Total		**5,359.0**	**5,359.0**	**5,260.8**	**5,284.9**	**5,220.3**	**5,289.5**	**4,845.8**	**4,805.5**	**4,805.5**	**4,773.5**	**4,773.5**	**4,368.6**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.0100	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
On-Site Fuel/Lube Truck	0.0100	2.2	2.2	2.2	2.2	2.2	2.2	1.1	1.1	1.1	1.1	1.1	1.1
On-Site Flatbed Truck	0.0660	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8
On-Site Watering Truck	0.0104	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
On-Site Dump Truck	0.0104	2.3	2.3	2.3	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0100	43.9	43.9	21.9	21.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Off-Site Asphalt Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	9.2	9.2	9.2	9.2	9.2	9.2
Off-Site Cement Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0087	2,417.5	2,118.2	2,083.6	1,922.5	1,911.0	1,749.8	1,450.5	1,358.4	1,220.3	1,208.7	1,197.2	1,139.7
Off-Site Dump Trucks	0.0104	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
Off-Site Low Boy Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0087	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	11.5	11.5	11.5
Off-Site Pipe Hauling Trucks	0.0104	109.9	109.9	109.9	27.5	27.5	27.5	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.0104	2.3	2.3	2.3	2.3	2.3	2.3	1.1	1.1	1.1	1.1	1.1	1.1
Off-Site Fuel/Lube Trucks	0.0100	13.2	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
On-Site Motor Vehicle Total		**31.4**	**31.4**	**31.4**	**30.2**	**30.2**	**30.2**	**29.1**	**29.1**	**29.1**	**29.1**	**29.1**	**29.1**
Off-Site Motor Vehicle Total		**2,624.2**	**2,320.5**	**2,264.0**	**2,020.4**	**1,991.4**	**1,830.2**	**1,511.4**	**1,419.4**	**1,281.2**	**1,262.0**	**1,250.5**	**1,193.0**

Note: Totals may not match sum of individual values because of rounding.

Table 8-D

Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.0986	39.0	39.0	39.0	39.0	39.0	39.0	39.0	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8
Asphalt Paver, Cat A-8008	0.1731	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.1000	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	11.0	11.0	11.0	11.0	11.0
Compactor, Cat CS-563	0.1567	17.2	17.2	17.2	17.2	17.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.1310	0.0	0.0	0.0	0.0	11.5	11.5	23.1	23.1	23.1	23.1	23.1	23.1	11.5	11.5	11.5
Crane, 20-Ton, TR400	0.1310	0.0	0.0	0.0	14.4	14.4	14.4	14.4	14.4	28.8	28.8	28.8	28.8	28.8	28.8	28.8
Crane, 225-Ton, Manitowoc, 4100W	0.1906	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8	16.8	16.8	16.8	33.5	33.5	33.5	33.5
Crane, 40-Ton, Grove, TR700B	0.1310	0.0	0.0	14.4	14.4	14.4	28.8	28.8	28.8	28.8	28.8	28.8	43.2	43.2	57.6	57.6
Loader, Cat, 938F	0.1573	17.3	17.3	17.3	17.3	17.3	17.3	17.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.1857	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Trencher, Cat 140G	0.1593	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Truck, Concrete Pump, International	0.1723	15.2	30.3	30.3	30.3	30.3	30.3	30.3	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Welder, Multiquip, BLW-300SS	0.0249	3.3	3.3	3.3	6.6	9.8	19.7	29.5	29.5	29.5	29.5	29.5	29.5	26.2	23.0	19.7
Welder, Multiquip, GA 3800	0.1273	91.1	91.1	91.1	91.1	127.5	127.5	127.5	127.5	127.5	127.5	145.7	163.9	163.9	163.9	163.9
Construction Equipment Total		**250.6**	**265.8**	**280.2**	**297.9**	**349.1**	**356.1**	**377.5**	**371.6**	**386.0**	**386.0**	**393.2**	**442.6**	**427.8**	**438.9**	**435.6**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.0010	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
On-Site Fuel/Lube Truck	0.0010	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
On-Site Flatbed Truck	0.0040	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.3	1.3	1.3	1.3	1.3	1.3	1.3
On-Site Watering Truck	0.0025	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
On-Site Dump Truck	0.0025	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0010	1.7	1.7	1.7	1.7	1.7	3.8	3.8	6.4	6.4	8.5	8.5	8.5	6.4	6.4	4.3
Off-Site Asphalt Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0025	0.0	0.0	5.5	5.5	5.5	5.5	5.5	6.6	6.6	3.3	1.1	1.1	1.1	1.1	1.1
Off-Site Construction Worker Commute	0.0008	136.4	156.5	176.6	195.7	215.8	266.5	278.2	282.4	284.5	287.7	287.7	301.4	287.7	273.9	240.1
Off-Site Dump Trucks	0.0025	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Off-Site Low Boy Trucks	0.0025	0.0	0.0	0.0	0.0	4.1	4.1	4.1	4.1	4.1	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0008	1.8	1.8	1.8	1.8	1.8	1.8	2.5	4.2	4.2	3.5	3.5	3.5	3.5	3.5	3.5
Off-Site Pipe Hauling Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	26.3	26.3	52.6	52.6	52.6	52.6	26.3	26.3	26.3	26.3
Off-Site Water Trucks	0.0025	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Off-Site Fuel/Lube Trucks	0.0010	0.9	0.9	0.9	0.9	0.9	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
On-Site Motor Vehicle Total		**1.9**	**1.9**	**1.9**	**1.9**	**1.9**	**2.2**	**2.2**	**2.2**	**2.6**	**2.7**	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**
Off-Site Motor Vehicle Total		**145.4**	**165.5**	**191.1**	**210.1**	**234.3**	**314.0**	**326.3**	**362.3**	**364.6**	**361.8**	**359.7**	**347.1**	**331.2**	**317.5**	**281.5**

Table 8-D (continued)
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month) Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.0986	48.8	48.8	48.8	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	0.0
Asphalt Paver, Cat A-8008	0.1731	0.0	0.0	0.0	0.0	0.0	0.0	45.7	45.7	45.7	45.7	45.7	0.0
Backhoe, Cat, 420E	0.1000	11.0	11.0	11.0	11.0	11.0	11.0	11.0	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.1567	0.0	0.0	0.0	0.0	0.0	17.2	17.2	17.2	17.2	17.2	17.2	0.0
Crane, 150-Ton, Manitowoc	0.1310	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.1310	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
Crane, 225-Ton, Manitowoc, 4100W	0.1906	16.8	16.8	16.8	16.8	16.8	16.8	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.1310	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
Loader, Cat, 938F	0.1573	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.1857	24.5	24.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.1593	21.0	21.0	21.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.1723	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.0249	19.7	19.7	19.7	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4
Welder, Multiquip, GA 3800	0.1273	163.9	163.9	163.9	163.9	163.9	163.9	145.7	145.7	145.7	145.7	145.7	145.7
Construction Equipment Total		**374.9**	**374.9**	**350.4**	**356.8**	**335.8**	**353.0**	**363.8**	**352.8**	**352.8**	**341.2**	**341.2**	**219.7**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.0010	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
On-Site Fuel/Lube Truck	0.0010	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Flatbed Truck	0.0040	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
On-Site Watering Truck	0.0025	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
On-Site Dump Truck	0.0025	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0010	4.3	4.3	2.1	2.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Asphalt Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2
Off-Site Cement Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0008	222.1	194.6	191.4	176.6	175.6	160.8	133.3	124.8	112.1	111.1	110.0	104.7
Off-Site Dump Trucks	0.0025	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Off-Site Low Boy Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0008	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.1	1.1	1.1
Off-Site Pipe Hauling Trucks	0.0025	26.3	26.3	26.3	6.6	6.6	6.6	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.0025	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Fuel/Lube Trucks	0.0010	1.3	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
On-Site Motor Vehicle Total		**2.8**	**2.8**	**2.8**	**2.6**	**2.6**	**2.6**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
Off-Site Motor Vehicle Total		**260.6**	**232.7**	**227.4**	**192.9**	**190.1**	**175.3**	**143.2**	**134.7**	**122.0**	**120.2**	**119.2**	**113.9**

Note: Totals may not match sum of individual values because of rounding.

Table 8-E
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.5945	235.4	235.4	235.4	235.4	235.4	235.4	235.4	294.3	294.3	294.3	294.3	294.3	294.3	294.3	294.3
Asphalt Paver, Cat A-8008	1.0144	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.6082	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8	133.8	66.9	66.9	66.9	66.9	66.9
Compactor, Cat CS-563	1.2714	139.9	139.9	139.9	139.9	139.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	1.3109	0.0	0.0	0.0	0.0	115.4	115.4	230.7	230.7	230.7	230.7	230.7	230.7	115.4	115.4	115.4
Crane, 20-Ton, TR400	1.3109	0.0	0.0	0.0	144.2	144.2	144.2	144.2	144.2	288.4	288.4	288.4	288.4	288.4	288.4	288.4
Crane, 225-Ton, Manitowoc, 4100W	1.8726	0.0	0.0	0.0	0.0	0.0	0.0	0.0	164.8	164.8	164.8	164.8	329.6	329.6	329.6	329.6
Crane, 40-Ton, Grove, TR700B	1.3109	0.0	0.0	144.2	144.2	144.2	288.4	288.4	288.4	288.4	288.4	288.4	432.6	432.6	576.8	576.8
Loader, Cat, 938F	1.2278	135.1	135.1	135.1	135.1	135.1	135.1	135.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	1.4427	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4
Trencher, Cat 140G	0.9488	125.2	125.2	125.2	125.2	125.2	125.2	125.2	125.2	125.2	125.2	125.2	125.2	125.2	125.2	125.2
Truck, Concrete Pump, International	1.7369	152.8	305.7	305.7	305.7	305.7	305.7	305.7	152.8	152.8	152.8	152.8	152.8	152.8	152.8	152.8
Welder, Multiquip, BLW-300SS	0.1085	14.3	14.3	14.3	28.7	43.0	86.0	129.0	129.0	129.0	129.0	129.0	129.0	114.6	100.3	86.0
Welder, Multiquip, GA 3800	0.0533	38.1	38.1	38.1	38.1	53.4	53.4	53.4	53.4	53.4	53.4	61.0	68.6	68.6	68.6	68.6
Construction Equipment Total		**1,165.1**	**1,318.0**	**1,462.2**	**1,620.7**	**1,765.6**	**1,812.9**	**1,971.3**	**1,907.0**	**2,051.2**	**2,051.2**	**1,991.9**	**2,308.5**	**2,178.9**	**2,308.7**	**2,294.4**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.0014	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5
On-Site Fuel/Lube Truck	0.0014	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
On-Site Flatbed Truck	0.0100	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3
On-Site Watering Truck	0.0370	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
On-Site Dump Truck	0.0370	4.1	4.1	4.1	4.1	4.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0014	2.5	2.5	2.5	2.5	2.5	5.6	5.6	9.4	9.4	12.5	12.5	12.5	9.4	9.4	6.3
Off-Site Asphalt Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0370	0.0	0.0	81.4	81.4	81.4	81.4	81.4	97.7	97.7	48.8	16.3	16.3	16.3	16.3	16.3
Off-Site Construction Worker Commute	0.0007	125.9	144.5	163.0	180.6	199.2	246.0	256.8	260.7	262.6	265.5	265.5	278.2	265.5	252.9	221.6
Off-Site Dump Trucks	0.0370	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1
Off-Site Low Boy Trucks	0.0370	0.0	0.0	0.0	0.0	61.0	61.0	61.0	61.0	61.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0007	1.6	1.6	1.6	1.6	1.6	1.6	2.3	3.9	3.9	3.3	3.3	3.3	3.3	3.3	3.3
Off-Site Pipe Hauling Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	390.7	390.7	781.4	781.4	781.4	781.4	390.7	390.7	390.7	390.7
Off-Site Water Trucks	0.0370	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
Off-Site Fuel/Lube Trucks	0.0014	1.3	1.3	1.3	1.3	1.3	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
On-Site Motor Vehicle Total		**13.3**	**13.3**	**13.3**	**13.3**	**13.3**	**17.3**	**17.3**	**17.3**	**18.4**	**18.6**	**18.7**	**18.7**	**18.7**	**18.7**	**18.7**
Off-Site Motor Vehicle Total		**200.5**	**219.1**	**319.0**	**336.6**	**416.2**	**857.5**	**868.9**	**1,285.1**	**1,291.1**	**1,186.7**	**1,154.1**	**776.1**	**760.3**	**747.6**	**713.2**

Table 8-E (continued)
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month) Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.5945	294.3	294.3	294.3	353.1	353.1	353.1	353.1	353.1	353.1	353.1	353.1	0.0
Asphalt Paver, Cat A-8008	1.0144	0.0	0.0	0.0	0.0	0.0	0.0	267.8	267.8	267.8	267.8	267.8	0.0
Backhoe, Cat, 420E	0.6082	66.9	66.9	66.9	66.9	66.9	66.9	66.9	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	1.2714	0.0	0.0	0.0	0.0	0.0	139.9	139.9	139.9	139.9	139.9	139.9	0.0
Crane, 150-Ton, Manitowoc	1.3109	115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4	0.0	0.0	0.0
Crane, 20-Ton, TR400	1.3109	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4
Crane, 225-Ton, Manitowoc, 4100W	1.8726	164.8	164.8	164.8	164.8	164.8	164.8	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	1.3109	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4	288.4
Loader, Cat, 938F	1.2278	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	1.4427	190.4	190.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.9488	125.2	125.2	125.2	125.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	1.7369	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.1085	86.0	86.0	86.0	71.6	71.6	71.6	71.6	71.6	71.6	71.6	71.6	71.6
Welder, Multiquip, GA 3800	0.0533	68.6	68.6	68.6	68.6	68.6	68.6	61.0	61.0	61.0	61.0	61.0	61.0
Construction Equipment Total		**1,688.4**	**1,688.4**	**1,497.9**	**1,542.5**	**1,417.2**	**1,557.1**	**1,652.5**	**1,585.6**	**1,585.6**	**1,470.2**	**1,470.2**	**709.4**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.0014	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
On-Site Fuel/Lube Truck	0.0014	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
On-Site Flatbed Truck	0.0100	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
On-Site Watering Truck	0.0370	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
On-Site Dump Truck	0.0370	8.1	8.1	8.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0014	6.3	6.3	3.1	3.1	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Off-Site Asphalt Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	32.6	32.6	32.6	32.6	32.6	32.6
Off-Site Cement Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0007	205.0	179.6	176.7	163.0	162.1	148.4	123.0	115.2	103.5	102.5	101.5	96.7
Off-Site Dump Trucks	0.0370	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1
Off-Site Low Boy Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0007	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.0	1.0	1.0
Off-Site Pipe Hauling Trucks	0.0370	390.7	390.7	390.7	97.7	97.7	97.7	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.0370	8.1	8.1	8.1	8.1	8.1	8.1	4.1	4.1	4.1	4.1	4.1	4.1
Off-Site Fuel/Lube Trucks	0.0014	1.9	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
On-Site Motor Vehicle Total		**18.7**	**18.7**	**18.7**	**14.7**	**14.7**	**14.7**	**14.5**	**14.5**	**14.5**	**14.5**	**14.5**	**14.5**
Off-Site Motor Vehicle Total		**678.7**	**652.7**	**646.7**	**340.0**	**336.5**	**322.8**	**228.3**	**220.4**	**208.7**	**207.1**	**206.1**	**201.2**

Note: Totals may not match sum of individual values because of rounding.

Table 8-F
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.00055	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Asphalt Paver, Cat A-8008	0.00081	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.00061	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Compactor, Cat CS-563	0.00122	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.00126	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Crane, 20-Ton, TR400	0.00126	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Crane, 225-Ton, Manitowoc, 4100W	0.00177	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Crane, 40-Ton, Grove, TR700B	0.00126	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.6	0.6
Loader, Cat, 938F	0.00120	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.00139	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Trencher, Cat 140G	0.00076	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Truck, Concrete Pump, International	0.00187	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Welder, Multiquip, BLW-300SS	0.00014	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Welder, Multiquip, GA 3800	0.00015	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Construction Equipment Total		**1.2**	**1.4**	**1.5**	**1.7**	**1.8**	**1.9**	**2.1**	**2.0**	**2.1**	**2.1**	**2.1**	**2.4**	**2.2**	**2.4**	**2.4**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1
Off-Site Asphalt Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00007	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00007	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Low Boy Trucks	0.00007	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.5	1.5	1.5	1.5	0.8	0.8	0.8	0.8
Off-Site Water Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.2**	**0.2**	**0.4**	**0.4**	**0.5**	**1.3**	**1.3**	**2.2**	**2.2**	**2.0**	**1.9**	**1.2**	**1.1**	**1.1**	**1.1**

Table 8-F (continued)

Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.00055	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
Asphalt Paver, Cat A-8008	0.00081	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.0
Backhoe, Cat, 420E	0.00061	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.00122	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Crane, 150-Ton, Manitowoc	0.00126	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.00126	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Crane, 225-Ton, Manitowoc, 4100W	0.00177	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.00126	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Loader, Cat, 938F	0.00120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.00139	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.00076	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.00187	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00014	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Welder, Multiquip, GA 3800	0.00015	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Construction Equipment Total		**1.8**	**1.8**	**1.6**	**1.6**	**1.5**	**1.6**	**1.7**	**1.6**	**1.6**	**1.5**	**1.5**	**0.8**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00002	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Cement Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00007	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Low Boy Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.8	0.8	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**1.0**	**1.0**	**1.0**	**0.4**	**0.4**	**0.4**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**

Note: Totals may not match sum of individual values because of rounding.

Table 8-G

Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.05268	20.9	20.9	20.9	20.9	20.9	20.9	20.9	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1
Asphalt Paver, Cat A-8008	0.08908	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05583	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	6.1	6.1	6.1	6.1	6.1
Compactor, Cat CS-563	0.06886	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.04990	0.0	0.0	0.0	0.0	4.4	4.4	8.8	8.8	8.8	8.8	8.8	8.8	4.4	4.4	4.4
Crane, 20-Ton, TR400	0.04990	0.0	0.0	0.0	5.5	5.5	5.5	5.5	5.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Crane, 225-Ton, Manitowoc, 4100W	0.07225	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	6.4	6.4	6.4	12.7	12.7	12.7	12.7
Crane, 40-Ton, Grove, TR700B	0.04990	0.0	0.0	5.5	5.5	5.5	11.0	11.0	11.0	11.0	11.0	11.0	16.5	16.5	22.0	22.0
Loader, Cat, 938F	0.07020	7.7	7.7	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.08278	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
Trencher, Cat 140G	0.08078	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Truck, Concrete Pump, International	0.06130	5.4	10.8	10.8	10.8	10.8	10.8	10.8	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Welder, Multiquip, BLW-300SS	0.00764	1.0	1.0	1.0	2.0	3.0	6.1	9.1	9.1	9.1	9.1	9.1	9.1	8.1	7.1	6.1
Welder, Multiquip, GA 3800	0.04210	30.1	30.1	30.1	30.1	42.1	42.1	42.1	42.1	42.1	42.1	48.2	54.2	54.2	54.2	54.2
Construction Equipment Total		**106.5**	**111.9**	**117.4**	**123.9**	**141.4**	**142.3**	**149.7**	**148.2**	**153.7**	**153.7**	**153.5**	**171.4**	**166.0**	**170.5**	**169.5**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00154	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
On-Site Dump Truck	0.00154	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00004	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.2
Off-Site Asphalt Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00154	0.0	0.0	3.4	3.4	3.4	3.4	3.4	4.1	4.1	2.0	0.7	0.7	0.7	0.7	0.7
Off-Site Construction Worker Commute	0.00003	5.2	6.0	6.8	7.5	8.3	10.3	10.7	10.9	10.9	11.1	11.1	11.6	11.1	10.5	9.2
Off-Site Dump Trucks	0.00154	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Off-Site Low Boy Trucks	0.00154	0.0	0.0	0.0	0.0	2.5	2.5	2.5	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pipe Hauling Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	16.2	16.2	32.5	32.5	32.5	32.5	16.2	16.2	16.2	16.2
Off-Site Water Trucks	0.00154	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Fuel/Lube Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Motor Vehicle Total		**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Off-Site Motor Vehicle Total		**8.3**	**9.1**	**13.2**	**14.0**	**17.3**	**35.6**	**36.1**	**53.3**	**53.6**	**49.2**	**47.8**	**32.1**	**31.5**	**31.0**	**29.6**

Table 8-G (continued)
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month) Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.05268	26.1	26.1	26.1	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	0.0
Asphalt Paver, Cat A-8008	0.08908	0.0	0.0	0.0	0.0	0.0	0.0	23.5	23.5	23.5	23.5	23.5	0.0
Backhoe, Cat, 420E	0.05583	6.1	6.1	6.1	6.1	6.1	6.1	6.1	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.06886	0.0	0.0	0.0	0.0	0.0	7.6	7.6	7.6	7.6	7.6	7.6	0.0
Crane, 150-Ton, Manitowoc	0.04990	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04990	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Crane, 225-Ton, Manitowoc, 4100W	0.07225	6.4	6.4	6.4	6.4	6.4	6.4	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.04990	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Loader, Cat, 938F	0.07020	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.08278	10.9	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.08078	10.7	10.7	10.7	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.06130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00764	6.1	6.1	6.1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Welder, Multiquip, GA 3800	0.04210	54.2	54.2	54.2	54.2	54.2	54.2	48.2	48.2	48.2	48.2	48.2	48.2
Construction Equipment Total		**146.8**	**146.8**	**135.8**	**140.0**	**129.4**	**136.9**	**148.1**	**141.9**	**141.9**	**137.6**	**137.6**	**75.2**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00154	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
On-Site Dump Truck	0.00154	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00004	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4
Off-Site Cement Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	8.5	7.5	7.4	6.8	6.8	6.2	5.1	4.8	4.3	4.3	4.2	4.0
Off-Site Dump Trucks	0.00154	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Off-Site Low Boy Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00154	16.2	16.2	16.2	4.1	4.1	4.1	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00154	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Fuel/Lube Trucks	0.00004	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Off-Site Motor Vehicle Total		**28.1**	**27.1**	**26.8**	**14.1**	**14.0**	**13.4**	**9.5**	**9.2**	**8.7**	**8.6**	**8.6**	**8.4**

Note: Totals may not match sum of individual values because of rounding.

Table 8-H
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

		Monthly Emissions (lb/month)														
Equipment/Vehicle Type	**Emission Factor (lb/hr or lb/mile)**	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**	**Month 13**	**Month 14**	**Month 15**
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.04847	19.2	19.2	19.2	19.2	19.2	19.2	19.2	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Asphalt Paver, Cat A-8008	0.08195	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05137	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	5.7	5.7	5.7	5.7	5.7
Compactor, Cat CS-563	0.06335	7.0	7.0	7.0	7.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.04591	0.0	0.0	0.0	0.0	4.0	4.0	8.1	8.1	8.1	8.1	8.1	8.1	4.0	4.0	4.0
Crane, 20-Ton, TR400	0.04591	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Crane, 225-Ton, Manitowoc, 4100W	0.06647	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	5.8	5.8	5.8	11.7	11.7	11.7	11.7
Crane, 40-Ton, Grove, TR700B	0.04591	0.0	0.0	5.0	5.0	5.0	10.1	10.1	10.1	10.1	10.1	10.1	15.1	15.1	20.2	20.2
Loader, Cat, 938F	0.06458	7.1	7.1	7.1	7.1	7.1	7.1	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.07616	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Trencher, Cat 140G	0.07432	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Truck, Concrete Pump, International	0.05639	5.0	9.9	9.9	9.9	9.9	9.9	9.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Welder, Multiquip, BLW-300SS	0.00703	0.9	0.9	0.9	1.9	2.8	5.6	8.4	8.4	8.4	8.4	8.4	8.4	7.4	6.5	5.6
Welder, Multiquip, GA 3800	0.03183	22.8	22.8	22.8	22.8	31.9	31.9	31.9	31.9	31.9	31.9	36.4	41.0	41.0	41.0	41.0
Construction Equipment Total		**93.1**	**98.0**	**103.1**	**109.1**	**123.1**	**124.0**	**130.8**	**129.4**	**134.5**	**134.5**	**133.4**	**148.8**	**143.8**	**148.0**	**147.0**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00142	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
On-Site Dump Truck	0.00142	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00004	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Off-Site Asphalt Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00142	0.0	0.0	3.1	3.1	3.1	3.1	3.1	3.7	3.7	1.9	0.6	0.6	0.6	0.6	0.6
Off-Site Construction Worker Commute	0.00003	4.9	5.6	6.3	7.0	7.7	9.5	9.9	10.1	10.2	10.3	10.3	10.8	10.3	9.8	8.6
Off-Site Dump Trucks	0.00142	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Off-Site Low Boy Trucks	0.00142	0.0	0.0	0.0	0.0	2.3	2.3	2.3	2.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pipe Hauling Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	14.9	14.9	29.9	29.9	29.9	29.9	14.9	14.9	14.9	14.9
Off-Site Water Trucks	0.00142	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Fuel/Lube Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Motor Vehicle Total		**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Off-Site Motor Vehicle Total		**8.1**	**8.8**	**12.6**	**13.3**	**16.4**	**33.4**	**33.8**	**49.7**	**49.9**	**45.9**	**44.7**	**30.2**	**29.7**	**29.2**	**27.9**

Table 8-H (continued)

Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.04847	24.0	24.0	24.0	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	0.0
Asphalt Paver, Cat A-8008	0.08195	0.0	0.0	0.0	0.0	0.0	0.0	21.6	21.6	21.6	21.6	21.6	0.0
Backhoe, Cat, 420E	0.05137	5.7	5.7	5.7	5.7	5.7	5.7	5.7	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.06335	0.0	0.0	0.0	0.0	0.0	7.0	7.0	7.0	7.0	7.0	7.0	0.0
Crane, 150-Ton, Manitowoc	0.04591	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04591	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Crane, 225-Ton, Manitowoc, 4100W	0.06647	5.8	5.8	5.8	5.8	5.8	5.8	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.04591	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Loader, Cat, 938F	0.06458	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.07616	10.1	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.07432	9.8	9.8	9.8	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.05639	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00703	5.6	5.6	5.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Welder, Multiquip, GA 3800	0.03183	41.0	41.0	41.0	41.0	41.0	41.0	36.4	36.4	36.4	36.4	36.4	36.4
Construction Equipment Total		**126.1**	**126.1**	**116.1**	**119.9**	**110.1**	**117.1**	**128.3**	**122.7**	**122.7**	**118.6**	**118.6**	**61.3**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00142	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
On-Site Dump Truck	0.00142	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00004	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2
Off-Site Cement Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	7.9	6.9	6.8	6.3	6.3	5.7	4.8	4.5	4.0	4.0	3.9	3.7
Off-Site Dump Trucks	0.00142	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Off-Site Low Boy Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00142	14.9	14.9	14.9	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00142	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Fuel/Lube Trucks	0.00004	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.6**	**0.6**	**0.6**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Off-Site Motor Vehicle Total		**26.5**	**25.5**	**25.3**	**13.4**	**13.3**	**12.8**	**9.2**	**8.9**	**8.4**	**8.4**	**8.3**	**8.1**

Note: Totals may not match sum of individual values because of rounding.

Table 8-I

Combined Cycle Facility Construction Monthly Motor Vehicle Fugitive PM10 Emissions

Vehicle Type	Emission Factor (lb/mile)	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
		Monthly Emissions (lb/month)														
On-site Vehicles																
On-Site Welding Truck	1.04	229.3	229.3	229.3	229.3	229.3	229.3	229.3	229.3	229.3	229.3	344.0	344.0	344.0	344.0	344.0
On-Site Fuel/Lube Truck	1.04	114.7	114.7	114.7	114.7	114.7	114.7	114.7	114.7	114.7	229.3	229.3	229.3	229.3	229.3	229.3
On-Site Flatbed Truck	1.04	229.3	229.3	229.3	229.3	229.3	229.3	229.3	229.3	344.0	344.0	344.0	344.0	344.0	344.0	344.0
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	1.04	114.7	114.7	114.7	114.7	114.7	229.3	229.3	229.3	229.3	229.3	229.3	229.3	229.3	229.3	229.3
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00090	1.6	1.6	1.6	1.6	1.6	3.6	3.6	5.9	5.9	7.9	7.9	7.9	5.9	5.9	3.9
Off-Site Asphalt Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00100	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.6	2.6	1.3	0.4	0.4	0.4	0.4	0.4
Off-Site Construction Worker Commute	0.00092	156.3	179.3	202.3	224.1	247.1	305.3	318.6	323.5	325.9	329.5	329.5	345.3	329.5	313.8	275.0
Off-Site Dump Trucks	0.00100	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Off-Site Low Boy Trucks	0.00100	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00092	2.0	2.0	2.0	2.0	2.0	2.0	2.8	4.8	4.8	4.0	4.0	4.0	4.0	4.0	4.0
Off-Site Pipe Hauling Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	10.6	10.6	21.2	21.2	21.2	21.2	10.6	10.6	10.6	10.6
Off-Site Water Trucks	0.00100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Fuel/Lube Trucks	0.00090	0.8	0.8	0.8	0.8	0.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
On-Site Motor Vehicle Total		**688.0**	**688.0**	**688.0**	**688.0**	**688.0**	**802.6**	**802.6**	**802.6**	**917.3**	**1,031.9**	**1,146.6**	**1,146.6**	**1,146.6**	**1,146.6**	**1,146.6**
Off-Site Motor Vehicle Total		**162.5**	**185.6**	**210.8**	**232.6**	**257.3**	**328.4**	**342.5**	**362.8**	**365.3**	**367.1**	**366.3**	**371.4**	**353.7**	**337.9**	**297.2**

Table 8-I (continued)

Combined Cycle Facility Construction Monthly Motor Vehicle Fugitive PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/mile)	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
		Monthly Emissions (lb/month)											
On-site Vehicles													
On-Site Welding Truck	1.04	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0
On-Site Fuel/Lube Truck	1.04	229.3	229.3	229.3	229.3	229.3	229.3	114.7	114.7	114.7	114.7	114.7	114.7
On-Site Flatbed Truck	1.04	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0	344.0
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	1.04	229.3	229.3	229.3	114.7	114.7	114.7	114.7	114.7	114.7	114.7	114.7	114.7
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00090	3.9	3.9	2.0	2.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Asphalt Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9
Off-Site Cement Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	254.4	222.9	219.3	202.3	201.1	184.1	152.6	143.0	128.4	127.2	126.0	119.9
Off-Site Dump Trucks	0.00100	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Off-Site Low Boy Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00092	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.2	1.2	1.2
Off-Site Pipe Hauling Trucks	0.00100	10.6	10.6	10.6	2.6	2.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00100	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Fuel/Lube Trucks	0.00090	1.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
On-Site Motor Vehicle Total		**1,146.6**	**1,146.6**	**1,146.6**	**1,031.9**	**1,031.9**	**1,031.9**	**917.3**	**917.3**	**917.3**	**917.3**	**917.3**	**917.3**
Off-Site Motor Vehicle Total		**274.1**	**242.2**	**236.6**	**211.7**	**208.9**	**192.0**	**158.6**	**148.9**	**134.4**	**132.4**	**131.1**	**125.1**

Note: Totals may not match sum of individual values because of rounding.

Table 8-J
Combined Cycle Facility Construction Monthly Motor Vehicle Fugitive PM2.5 Emissions

Vehicle Type	Emission Factor (lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-site Vehicles																
On-Site Welding Truck	0.22	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	72.9	72.9	72.9	72.9	72.9
On-Site Fuel/Lube Truck	0.22	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	48.6	48.6	48.6	48.6	48.6	48.6
On-Site Flatbed Truck	0.22	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	72.9	72.9	72.9	72.9	72.9	72.9	72.9
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.22	24.3	24.3	24.3	24.3	24.3	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00016	0.3	0.3	0.3	0.3	0.3	0.6	0.6	1.0	1.0	1.4	1.4	1.4	1.0	1.0	0.7
Off-Site Asphalt Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00019	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.3	0.1	0.1	0.1	0.1	0.1
Off-Site Construction Worker Commute	0.00017	28.2	32.4	36.5	40.4	44.6	55.1	57.5	58.4	58.8	59.5	59.5	62.3	59.5	56.6	49.6
Off-Site Dump Trucks	0.00019	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Low Boy Trucks	0.00019	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00017	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.9	0.9	0.7	0.7	0.7	0.7	0.7	0.7
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	2.1	2.1	4.1	4.1	4.1	4.1	2.1	2.1	2.1	2.1
Off-Site Water Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00016	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
On-Site Motor Vehicle Total		**145.9**	**145.9**	**145.9**	**145.9**	**145.9**	**170.2**	**170.2**	**170.2**	**194.5**	**218.8**	**243.1**	**243.1**	**243.1**	**243.1**	**243.1**
Off-Site Motor Vehicle Total		**29.3**	**33.5**	**38.1**	**42.0**	**46.5**	**59.5**	**62.0**	**65.8**	**66.3**	**66.5**	**66.4**	**67.2**	**64.0**	**61.1**	**53.8**

Table 8-J (continued)
Combined Cycle Facility Construction Monthly Motor Vehicle Fugitive PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
On-site Vehicles													
On-Site Welding Truck	0.22	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9
On-Site Fuel/Lube Truck	0.22	48.6	48.6	48.6	48.6	48.6	48.6	24.3	24.3	24.3	24.3	24.3	24.3
On-Site Flatbed Truck	0.22	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.22	48.6	48.6	48.6	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00016	0.7	0.7	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Asphalt Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Cement Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	45.9	40.2	39.6	36.5	36.3	33.2	27.5	25.8	23.2	23.0	22.7	21.6
Off-Site Dump Trucks	0.00019	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Low Boy Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00017	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2
Off-Site Pipe Hauling Trucks	0.00019	2.1	2.1	2.1	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00016	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Motor Vehicle Total		**243.1**	**243.1**	**243.1**	**218.8**	**218.8**	**218.8**	**194.5**	**194.5**	**194.5**	**194.5**	**194.5**	**194.5**
Off-Site Motor Vehicle Total		**49.6**	**43.9**	**42.9**	**38.3**	**37.8**	**34.7**	**28.7**	**26.9**	**24.3**	**23.9**	**23.7**	**22.6**

Note: Totals may not match sum of individual values because of rounding.

Table 8-K
Combined Cycle Facility Construction Monthly Fugitive PM10 and PM2.5 Activities

		Quantity per Month														
Activity	**Units**	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**	**Month 13**	**Month 14**	**Month 15**
Excavation	Cu. Yd.	319,184	319,184	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Pile Wind Erosion[a]	Acres-Days	45.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bulldozing and Grading	Hours	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132

Table 8-K (continued)
Combined Cycle Facility Construction Monthly Fugitive PM10 and PM2.5 Activities

		Quantity per Day											
Activity	**Units**	**Month 16**	**Month 17**	**Month 18**	**Month 19**	**Month 20**	**Month 21**	**Month 22**	**Month 23**	**Month 24**	**Month 25**	**Month 26**	**Month 27**
Excavation	Cu. Yd.	0	0	0	0	0	0	0	0	0	0	0	0
Storage Pile Wind Erosion[a]	Acres-Days	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bulldozing and Grading	Hours	132	132	0	0	0	0	0	0	0	0	0	0

[a] Based on 30 days per month

Table 8-L
Combined Cycle Facility Construction Monthly Fugitive PM10 Emissions

	Emission	Emissions (lb/month)														
Activity	**Factor**	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**	**Month 13**	**Month 14**	**Month 15**
Excavation	9.94E-04	317.1	317.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	4.3	193.1	193.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.617	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5
Total		**591.8**	**591.8**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**

Table 8-L (continued)
Combined Cycle Facility Construction Monthly Fugitive PM10 Emissions

	Emission	Emissions (lb/month)											
Activity	**Factor**	**Month 16**	**Month 17**	**Month 18**	**Month 19**	**Month 20**	**Month 21**	**Month 22**	**Month 23**	**Month 24**	**Month 25**	**Month 26**	**Month 27**
Excavation	9.94E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.617	81.5	81.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		**81.5**	**81.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 8-M
Combined Cycle Facility Construction Monthly Fugitive PM2.5 Emissions

	Emission	Emissions (lb/month)														
Activity	**Factor**	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**	**Month 13**	**Month 14**	**Month 15**
Excavation	2.07E-04	66.0	66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.9	40.2	40.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.128	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
Total		**123.1**	**123.1**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**

Table 8-M (continued)
Combined Cycle Facility Construction Monthly Fugitive PM2.5 Emissions

	Emission	Emissions (lb/month)											
Activity	**Factor**	**Month 16**	**Month 17**	**Month 18**	**Month 19**	**Month 20**	**Month 21**	**Month 22**	**Month 23**	**Month 24**	**Month 25**	**Month 26**	**Month 27**
Excavation	2.07E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.128	17.0	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		**17.0**	**17.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-A
Solar Array Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number													
			Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	4.5	0	0	0	0	0	1	1	3	6	6	6	6	6	6
Crane, 20-Ton, TR400	Diesel	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	6.5	0	0	0	0	0	0	6	9	9	12	12	12	12	12
Welder, Multiquip, BLW-300SS	Diesel	6	0	0	0	0	0	0	2	2	4	4	6	6	6	6
Backhoe, Cat, 420E	Diesel	6	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Trencher, Cat 140G	Diesel	6	0	0	0	0	0	0	1	1	1	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	6	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Scraper, CAT 657G, Tractor Engine	Diesel	8	0	4	4	4	4	4	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	8	0	4	4	4	4	4	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	6	0	0	0	0	0	0	0	0	2	2	2	2	2	2
Truck, Concrete Pump, International	Diesel	6	0	0	0	0	0	0	3	5	6	6	6	6	6	6
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	Diesel	9	0	8	8	8	8	8	3	3	3	3	3	3	2	2
On-Site Flatbed Truck	Gasoline	5	0	0	0	0	0	0	1	1	2	2	2	2	2	2
On-Site Pickup Truck	Gasoline	4	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	160	0	0	0	0	0	6	6	6	6	6	6	6	6	6
Off-Site Cement Trucks	Diesel	20	0	0	0	0	0	0	3	5	6	6	6	6	6	6
Off-Site Dump Trucks	Diesel	40	0	0	0	0	0	2	2	2	2	2	2	2	2	2
Off-Site Pickup Trucks	Gasoline	20	0	0	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Pipe Hauling Trucks	Diesel	14	0	0	0	0	0	2	2	2	2	2	2	2	2	2
Off-Site Water Trucks	Diesel	5	0	0	10	10	10	0	3	3	3	3	3	3	3	3
Off-Site Construction Worker Commute	Gasoline	60	5	5	40	40	40	60	80	100	140	180	220	340	360	300
Off-Site Tractor-Trailer	Diesel	200	0	0	0	0	0	12	12	12	12	12	12	12	12	12

Table 9-A (continued)
Solar Array Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number												
			Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment															
Air Compressor, Ingersoll-Rand	Diesel	4.5	6	3	3	3	3	3	3	3	0	0	0	0	0
Crane, 20-Ton, TR400	Diesel	6	0	0	1	1	1	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	6.5	12	9	9	9	6	6	6	6	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	6	6	6	6	6	6	6	4	2	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	6	1	1	1	1	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	6	0	0	1	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	6	1	1	1	1	1	1	1	1	0	0	0	0	0
Scraper, CAT 657G, Tractor Engine	Diesel	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	6	2	2	2	2	0	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	6	6	6	6	6	0	0	0	0	0	0	0	0	0
Motor Vehicles															
On-site Vehicles															
On-Site Watering Truck	Diesel	9	2	2	2	2	1	1	1	1	0	0	0	0	0
On-Site Flatbed Truck	Gasoline	5	2	2	2	2	2	2	2	2	0	0	0	0	0
On-Site Pickup Truck	Gasoline	4	2	2	2	2	2	2	2	2	0	0	0	0	0
Off-Site Vehicles															
Off-Site Flat Bed Trucks	Gasoline	160	6	6	6	6	6	6	6	6	0	0	0	0	0
Off-Site Cement Trucks	Diesel	20	6	6	6	6	0	0	0	0	0	0	0	0	0
Off-Site Dump Trucks	Diesel	40	2	2	2	2	2	2	2	2	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	20	2	2	2	2	2	2	2	2	2	2	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	14	2	2	2	2	2	2	2	2	0	0	0	0	0
Off-Site Water Trucks	Diesel	5	3	3	3	3	1	1	1	1	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	60	180	80	50	50	0	0	0	0	0	0	0	0	0
Off-Site Tractor-Trailer	Diesel	200	12	12	12	12	12	12	12	12	0	0	0	0	0

Table 9-B
Solar Array Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	0	0	0	0	0	99	99	297	594	594	594	594	594	594	594
Crane, 20-Ton, TR400	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	0	0	0	0	0	0	858	1,287	1,287	1,716	1,716	1,716	1,716	1,716	1,716
Welder, Multiquip, BLW-300SS	Diesel	0	0	0	0	0	0	264	264	528	528	792	792	792	792	792
Backhoe, Cat, 420E	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	132	132	132
Trencher, Cat 140G	Diesel	0	0	0	0	0	0	132	132	132	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	0	0	0	0	0	0	132	132	132	132	132	132	132	132	132
Scraper, CAT 657G, Tractor Engine	Diesel	0	704	704	704	704	704	0	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	0	704	704	704	704	704	0	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	0	0	0	0	0	0	0	0	264	264	264	264	264	264	264
Truck, Concrete Pump, International	Diesel	0	0	0	0	0	0	396	660	792	792	792	792	792	792	792
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	Diesel	0	1,584	1,584	1,584	1,584	1,584	594	594	594	594	594	594	396	396	396
On-Site Flatbed Truck	Gasoline	0	0	0	0	0	0	110	110	220	220	220	220	220	220	220
On-Site Pickup Truck	Gasoline	88	88	88	88	88	88	88	88	176	176	176	176	176	176	176
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	0	0	0	0	0	21,120	21,120	21,120	21,120	21,120	21,120	21,120	21,120	21,120	21,120
Off-Site Cement Trucks	Diesel	0	0	0	0	0	0	1,320	2,200	2,640	2,640	2,640	2,640	2,640	2,640	2,640
Off-Site Dump Trucks	Diesel	0	0	0	0	0	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760
Off-Site Pickup Trucks	Gasoline	0	0	880	880	880	880	880	880	880	880	880	880	880	880	880
Off-Site Pipe Hauling Trucks	Diesel	0	0	0	0	0	616	616	616	616	616	616	616	616	616	616
Off-Site Water Trucks	Diesel	0	0	1,100	1,100	1,100	0	330	330	330	330	330	330	330	330	330
Off-Site Construction Worker Commute	Gasoline	6,600	6,600	52,800	52,800	52,800	79,200	105,600	132,000	184,800	237,600	290,400	448,800	475,200	396,000	237,600
Off-Site Tractor-Trailer	Diesel	0	0	0	0	0	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800

Table 9-B (continued)
Solar Array Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	Diesel	297	297	297	297	297	297	297	0	0	0	0	0
Crane, 20-Ton, TR400	Diesel	0	132	132	132	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	1,287	1,287	1,287	858	858	858	858	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	792	792	792	792	792	528	264	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	132	132	132	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	0	132	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	132	132	132	132	132	132	132	0	0	0	0	0
Scraper, CAT 657G, Tractor Engine	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	264	264	264	0	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	792	792	792	0	0	0	0	0	0	0	0	0
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	Diesel	396	396	396	198	198	198	198	0	0	0	0	0
On-Site Flatbed Truck	Gasoline	220	220	220	220	220	220	220	0	0	0	0	0
On-Site Pickup Truck	Gasoline	176	176	176	176	176	176	176	0	0	0	0	0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	Gasoline	21,120	21,120	21,120	21,120	21,120	21,120	21,120	0	0	0	0	0
Off-Site Cement Trucks	Diesel	2,640	2,640	2,640	0	0	0	0	0	0	0	0	0
Off-Site Dump Trucks	Diesel	1,760	1,760	1,760	1,760	1,760	1,760	1,760	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	880	880	880	880	880	880	880	880	880	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	616	616	616	616	616	616	616	0	0	0	0	0
Off-Site Water Trucks	Diesel	330	330	330	110	110	110	110	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	105,600	66,000	66,000	0	0	0	0	0	0	0	0	0
Off-Site Tractor-Trailer	Diesel	52,800	52,800	52,800	52,800	52,800	52,800	52,800	0	0	0	0	0

a Based on 22 working days per month

Table 9-C
Solar Array Construction Monthly Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month) Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.3302	0.0	0.0	0.0	0.0	0.0	32.7	32.7	98.1	196.1	196.1	196.1	196.1	196.1	196.1	196.1
Crane, 20-Ton, TR400	0.3642	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	3.6411	0.0	0.0	0.0	0.0	0.0	0.0	3,124.1	4,686.1	4,686.1	6,248.1	6,248.1	6,248.1	6,248.1	6,248.1	6,248.1
Welder, Multiquip, BLW-300SS	0.0651	0.0	0.0	0.0	0.0	0.0	0.0	17.2	17.2	34.4	34.4	51.6	51.6	51.6	51.6	51.6
Backhoe, Cat, 420E	0.3664	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.4	48.4	48.4
Trencher, Cat 140G	0.4892	0.0	0.0	0.0	0.0	0.0	0.0	64.6	64.6	64.6	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.7439	0.0	0.0	0.0	0.0	0.0	0.0	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2
Scraper, CAT 657G, Tractor Engine	1.0062	0.0	708.3	708.3	708.3	708.3	708.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.5818	0.0	409.6	409.6	409.6	409.6	409.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.4902	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	129.4	129.4	129.4	129.4	129.4	129.4	129.4
Truck, Concrete Pump, International	0.4516	0.0	0.0	0.0	0.0	0.0	0.0	178.8	298.0	357.6	357.6	357.6	357.6	357.6	357.6	357.6
Construction Equipment Total		**0.0**	**1,117.9**	**1,117.9**	**1,117.9**	**1,117.9**	**1,150.6**	**3,515.5**	**5,262.2**	**5,566.4**	**7,063.9**	**7,081.1**	**7,081.1**	**7,129.4**	**7,129.4**	**7,129.4**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.0104	0.0	16.5	16.5	16.5	16.5	16.5	6.2	6.2	6.2	6.2	6.2	6.2	4.1	4.1	4.1
On-Site Flatbed Truck	0.0660	0.0	0.0	0.0	0.0	0.0	0.0	7.3	7.3	14.5	14.5	14.5	14.5	14.5	14.5	14.5
On-Site Pickup Truck	0.0087	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0100	0.0	0.0	0.0	0.0	0.0	210.5	210.5	210.5	210.5	210.5	210.5	210.5	210.5	210.5	210.5
Off-Site Cement Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	13.7	22.9	27.5	27.5	27.5	27.5	27.5	27.5	27.5
Off-Site Dump Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
Off-Site Pickup Trucks	0.0087	0.0	0.0	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Off-Site Pipe Hauling Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Off-Site Water Trucks	0.0104	0.0	0.0	11.4	11.4	11.4	0.0	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Off-Site Construction Worker Commute	0.0087	57.6	57.6	460.5	460.5	460.5	690.7	920.9	1,151.2	1,611.7	2,072.1	2,532.6	3,914.0	4,144.3	3,453.6	2,072.1
Off-Site Tractor-Trailer	0.0104	0.0	0.0	0.0	0.0	0.0	549.3	549.3	549.3	549.3	549.3	549.3	549.3	549.3	549.3	549.3
On-Site Motor Vehicle Total		**0.8**	**17.2**	**17.2**	**17.2**	**17.2**	**17.2**	**14.2**	**14.2**	**22.2**	**22.2**	**22.2**	**22.2**	**20.2**	**20.2**	**20.2**
Off-Site Motor Vehicle Total		**57.6**	**57.6**	**479.6**	**479.6**	**479.6**	**1,482.9**	**1,730.3**	**1,969.7**	**2,434.8**	**2,895.2**	**3,355.7**	**4,737.1**	**4,967.4**	**4,276.7**	**2,895.2**

Table 9-C (continued)
Solar Array Construction Monthly Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.3302	98.1	98.1	98.1	98.1	98.1	98.1	98.1	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.3642	0.0	48.1	48.1	48.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	3.6411	4,686.1	4,686.1	4,686.1	3,124.1	3,124.1	3,124.1	3,124.1	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.0651	51.6	51.6	51.6	51.6	51.6	34.4	17.2	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.3664	48.4	48.4	48.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.4892	0.0	64.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.7439	98.2	98.2	98.2	98.2	98.2	98.2	98.2	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	1.0062	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.5818	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.4902	129.4	129.4	129.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.4516	357.6	357.6	357.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**5,469.3**	**5,582.0**	**5,517.4**	**3,420.0**	**3,371.9**	**3,354.7**	**3,337.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.0104	4.1	4.1	4.1	2.1	2.1	2.1	2.1	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0660	14.5	14.5	14.5	14.5	14.5	14.5	14.5	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.0087	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0100	210.5	210.5	210.5	210.5	210.5	210.5	210.5	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0104	27.5	27.5	27.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.0104	18.3	18.3	18.3	18.3	18.3	18.3	18.3	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0087	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0104	6.4	6.4	6.4	6.4	6.4	6.4	6.4	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.0104	3.4	3.4	3.4	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0087	920.9	575.6	575.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.0104	549.3	549.3	549.3	549.3	549.3	549.3	549.3	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**20.2**	**20.2**	**20.2**	**18.1**	**18.1**	**18.1**	**18.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**1,744.1**	**1,398.7**	**1,398.7**	**793.4**	**793.4**	**793.4**	**793.4**	**7.7**	**7.7**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-D
Solar Array Construction Monthly Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.0986	0.0	0.0	0.0	0.0	0.0	9.8	9.8	29.3	58.6	58.6	58.6	58.6	58.6	58.6	58.6
Crane, 20-Ton, TR400	0.1310	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.1273	0.0	0.0	0.0	0.0	0.0	0.0	109.3	163.9	163.9	218.5	218.5	218.5	218.5	218.5	218.5
Welder, Multiquip, BLW-300SS	0.0249	0.0	0.0	0.0	0.0	0.0	0.0	6.6	6.6	13.1	13.1	19.7	19.7	19.7	19.7	19.7
Backhoe, Cat, 420E	0.1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	13.2	13.2
Trencher, Cat 140G	0.1593	0.0	0.0	0.0	0.0	0.0	0.0	21.0	21.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.1857	0.0	0.0	0.0	0.0	0.0	0.0	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Scraper, CAT 657G, Tractor Engine	0.2959	0.0	208.3	208.3	208.3	208.3	208.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.1711	0.0	120.5	120.5	120.5	120.5	120.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.1281	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.8	33.8	33.8	33.8	33.8	33.8	33.8
Truck, Concrete Pump, International	0.1723	0.0	0.0	0.0	0.0	0.0	0.0	68.2	113.7	136.4	136.4	136.4	136.4	136.4	136.4	136.4
Construction Equipment Total		**0.0**	**328.8**	**328.8**	**328.8**	**328.8**	**338.6**	**239.3**	**359.0**	**451.4**	**485.0**	**491.5**	**491.5**	**504.7**	**504.7**	**504.7**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.0025	0.0	3.9	3.9	3.9	3.9	3.9	1.5	1.5	1.5	1.5	1.5	1.5	1.0	1.0	1.0
On-Site Flatbed Truck	0.0040	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9
On-Site Pickup Truck	0.0008	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0010	0.0	0.0	0.0	0.0	0.0	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
Off-Site Cement Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	3.3	5.5	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Off-Site Dump Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Off-Site Pickup Trucks	0.0008	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Off-Site Pipe Hauling Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Off-Site Water Trucks	0.0025	0.0	0.0	2.7	2.7	2.7	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Off-Site Construction Worker Commute	0.0008	5.3	5.3	42.3	42.3	42.3	63.5	84.6	105.8	148.1	190.4	232.7	359.6	380.7	317.3	190.4
Off-Site Tractor-Trailer	0.0025	0.0	0.0	0.0	0.0	0.0	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5
On-Site Motor Vehicle Total		**0.1**	**4.0**	**4.0**	**4.0**	**4.0**	**4.0**	**2.0**	**2.0**	**2.5**	**2.5**	**2.5**	**2.5**	**2.0**	**2.0**	**2.0**
Off-Site Motor Vehicle Total		**5.3**	**5.3**	**45.8**	**45.8**	**45.8**	**222.1**	**247.3**	**270.7**	**314.1**	**356.4**	**398.7**	**525.6**	**546.8**	**483.3**	**356.4**

Table 9-D (continued)
Solar Array Construction Monthly Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.0986	29.3	29.3	29.3	29.3	29.3	29.3	29.3	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.1310	0.0	17.3	17.3	17.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.1273	163.9	163.9	163.9	109.3	109.3	109.3	109.3	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.0249	19.7	19.7	19.7	19.7	19.7	13.1	6.6	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.1000	13.2	13.2	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.1593	0.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.1857	24.5	24.5	24.5	24.5	24.5	24.5	24.5	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	0.2959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.1711	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.1281	33.8	33.8	33.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.1723	136.4	136.4	136.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**420.8**	**459.1**	**438.1**	**200.0**	**182.7**	**176.2**	**169.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.0025	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0040	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.0008	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0010	20.5	20.5	20.5	20.5	20.5	20.5	20.5	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0025	6.6	6.6	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.0025	4.4	4.4	4.4	4.4	4.4	4.4	4.4	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0008	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0025	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.0025	0.8	0.8	0.8	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0008	84.6	52.9	52.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.0025	131.5	131.5	131.5	131.5	131.5	131.5	131.5	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**2.0**	**2.0**	**2.0**	**1.5**	**1.5**	**1.5**	**1.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**250.6**	**218.9**	**218.9**	**158.9**	**158.9**	**158.9**	**158.9**	**0.7**	**0.7**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-E
Solar Array Construction Monthly Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.5945	0.0	0.0	0.0	0.0	0.0	58.9	58.9	176.6	353.1	353.1	353.1	353.1	353.1	353.1	353.1
Crane, 20-Ton, TR400	1.3109	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.0533	0.0	0.0	0.0	0.0	0.0	0.0	45.7	68.6	68.6	91.5	91.5	91.5	91.5	91.5	91.5
Welder, Multiquip, BLW-300SS	0.1085	0.0	0.0	0.0	0.0	0.0	0.0	28.7	28.7	57.3	57.3	86.0	86.0	86.0	86.0	86.0
Backhoe, Cat, 420E	0.6082	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.3	80.3	80.3
Trencher, Cat 140G	0.9488	0.0	0.0	0.0	0.0	0.0	0.0	125.2	125.2	125.2	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	1.4427	0.0	0.0	0.0	0.0	0.0	0.0	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4	190.4
Scraper, CAT 657G, Tractor Engine	2.4463	0.0	1,722.2	1,722.2	1,722.2	1,722.2	1,722.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	1.4146	0.0	995.9	995.9	995.9	995.9	995.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.9859	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	260.3	260.3	260.3	260.3	260.3	260.3	260.3
Truck, Concrete Pump, International	1.7369	0.0	0.0	0.0	0.0	0.0	0.0	687.8	1,146.4	1,375.6	1,375.6	1,375.6	1,375.6	1,375.6	1,375.6	1,375.6
Construction Equipment Total		**0.0**	**2,718.1**	**2,718.1**	**2,718.1**	**2,718.1**	**2,776.9**	**1,136.7**	**1,735.9**	**2,430.7**	**2,328.3**	**2,356.9**	**2,356.9**	**2,437.2**	**2,437.2**	**2,437.2**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.0370	0.0	58.6	58.6	58.6	58.6	58.6	22.0	22.0	22.0	22.0	22.0	22.0	14.7	14.7	14.7
On-Site Flatbed Truck	0.0100	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2
On-Site Pickup Truck	0.0007	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0014	0.0	0.0	0.0	0.0	0.0	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1
Off-Site Cement Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	48.8	81.4	97.7	97.7	97.7	97.7	97.7	97.7	97.7
Off-Site Dump Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1
Off-Site Pickup Trucks	0.0007	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Off-Site Pipe Hauling Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8
Off-Site Water Trucks	0.0370	0.0	0.0	40.7	40.7	40.7	0.0	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2
Off-Site Construction Worker Commute	0.0007	4.9	4.9	39.1	39.1	39.1	58.6	78.1	97.6	136.7	175.7	214.8	331.9	351.5	292.9	175.7
Off-Site Tractor-Trailer	0.0370	0.0	0.0	0.0	0.0	0.0	1,953.4	1,953.4	1,953.4	1,953.4	1,953.4	1,953.4	1,953.4	1,953.4	1,953.4	1,953.4
On-Site Motor Vehicle Total		**0.1**	**58.7**	**58.7**	**58.7**	**58.7**	**58.7**	**23.1**	**23.1**	**24.3**	**24.3**	**24.3**	**24.3**	**17.0**	**17.0**	**17.0**
Off-Site Motor Vehicle Total		**4.9**	**4.9**	**80.4**	**80.4**	**80.4**	**2,130.6**	**2,211.2**	**2,263.3**	**2,318.6**	**2,357.6**	**2,396.7**	**2,513.9**	**2,533.4**	**2,474.8**	**2,357.6**

Table 9-E (continued)
Solar Array Construction Monthly Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.5945	176.6	176.6	176.6	176.6	176.6	176.6	176.6	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	1.3109	0.0	173.0	173.0	173.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.0533	68.6	68.6	68.6	45.7	45.7	45.7	45.7	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.1085	86.0	86.0	86.0	86.0	86.0	57.3	28.7	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.6082	80.3	80.3	80.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.9488	0.0	125.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	1.4427	190.4	190.4	190.4	190.4	190.4	190.4	190.4	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	2.4463	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	1.4146	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.9859	260.3	260.3	260.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	1.7369	1,375.6	1,375.6	1,375.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**2,237.8**	**2,536.1**	**2,410.8**	**671.8**	**498.7**	**470.1**	**441.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.0370	14.7	14.7	14.7	7.3	7.3	7.3	7.3	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0100	2.2	2.2	2.2	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.0007	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0014	30.1	30.1	30.1	30.1	30.1	30.1	30.1	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0370	97.7	97.7	97.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.0370	65.1	65.1	65.1	65.1	65.1	65.1	65.1	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0007	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0370	22.8	22.8	22.8	22.8	22.8	22.8	22.8	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.0370	12.2	12.2	12.2	4.1	4.1	4.1	4.1	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0007	78.1	48.8	48.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.0370	1,953.4	1,953.4	1,953.4	1,953.4	1,953.4	1,953.4	1,953.4	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**17.0**	**17.0**	**17.0**	**9.7**	**9.7**	**9.7**	**9.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**2,260.0**	**2,230.7**	**2,230.7**	**2,076.1**	**2,076.1**	**2,076.1**	**2,076.1**	**0.7**	**0.7**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-F
Solar Array Construction Monthly Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.00055	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Crane, 20-Ton, TR400	0.00126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.00015	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Welder, Multiquip, BLW-300SS	0.00014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Backhoe, Cat, 420E	0.00061	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Trencher, Cat 140G	0.00076	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.00139	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Scraper, CAT 657G, Tractor Engine	0.00558	0.0	3.9	3.9	3.9	3.9	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.00315	0.0	2.2	2.2	2.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.00090	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Truck, Concrete Pump, International	0.00187	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Construction Equipment Total		**0.0**	**6.1**	**6.1**	**6.1**	**6.1**	**6.2**	**1.2**	**1.9**	**2.6**	**2.6**	**2.6**	**2.6**	**2.7**	**2.7**	**2.7**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.00007	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Cement Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Dump Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pickup Trucks	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00007	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00007	0.0	0.0	0.0	0.0	0.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
On-Site Motor Vehicle Total		**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**4.5**	**4.6**	**4.7**	**4.7**	**4.7**	**4.7**	**4.7**	**4.7**	**4.7**	**4.7**

Table 9-F (continued)
Solar Array Construction Monthly Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.00055	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.00126	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.00015	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00014	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.00061	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.00076	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.00139	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	0.00558	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.00315	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.00090	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.00187	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**2.5**	**2.7**	**2.6**	**0.8**	**0.6**	**0.6**	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00002	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00007	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00007	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00007	3.9	3.9	3.9	3.9	3.9	3.9	3.9	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**4.7**	**4.7**	**4.7**	**4.5**	**4.5**	**4.5**	**4.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-G
Solar Array Construction Monthly Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.05268	0.0	0.0	0.0	0.0	0.0	5.2	5.2	15.6	31.3	31.3	31.3	31.3	31.3	31.3	31.3
Crane, 20-Ton, TR400	0.04990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.04210	0.0	0.0	0.0	0.0	0.0	0.0	36.1	54.2	54.2	72.3	72.3	72.3	72.3	72.3	72.3
Welder, Multiquip, BLW-300SS	0.00764	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	4.0	4.0	6.1	6.1	6.1	6.1	6.1
Backhoe, Cat, 420E	0.05583	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	7.4	7.4
Trencher, Cat 140G	0.08078	0.0	0.0	0.0	0.0	0.0	0.0	10.7	10.7	10.7	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.08278	0.0	0.0	0.0	0.0	0.0	0.0	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
Scraper, CAT 657G, Tractor Engine	0.11226	0.0	79.0	79.0	79.0	79.0	79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.06492	0.0	45.7	45.7	45.7	45.7	45.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.05658	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	14.9
Truck, Concrete Pump, International	0.06130	0.0	0.0	0.0	0.0	0.0	0.0	24.3	40.5	48.5	48.5	48.5	48.5	48.5	48.5	48.5
Construction Equipment Total		**0.0**	**124.7**	**124.7**	**124.7**	**124.7**	**129.9**	**89.2**	**133.9**	**174.6**	**182.0**	**184.0**	**184.0**	**191.4**	**191.4**	**191.4**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.00154	0.0	2.4	2.4	2.4	2.4	2.4	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.6	0.6
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Off-Site Cement Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.4	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Off-Site Dump Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Off-Site Water Trucks	0.00154	0.0	0.0	1.7	1.7	1.7	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Off-Site Construction Worker Commute	0.00003	0.2	0.2	1.6	1.6	1.6	2.4	3.3	4.1	5.7	7.3	8.9	13.8	14.6	12.2	7.3
Off-Site Tractor-Trailer	0.00154	0.0	0.0	0.0	0.0	0.0	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2
On-Site Motor Vehicle Total		**0.0**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.6**	**0.6**	**0.6**
Off-Site Motor Vehicle Total		**0.2**	**0.2**	**3.3**	**3.3**	**3.3**	**88.2**	**91.6**	**93.7**	**96.0**	**97.7**	**99.3**	**104.2**	**105.0**	**102.6**	**97.7**

Table 9-G (continued)
Solar Array Construction Monthly Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.05268	15.6	15.6	15.6	15.6	15.6	15.6	15.6	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04990	0.0	6.6	6.6	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.04210	54.2	54.2	54.2	36.1	36.1	36.1	36.1	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00764	6.1	6.1	6.1	6.1	6.1	4.0	2.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05583	7.4	7.4	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.08078	0.0	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.08278	10.9	10.9	10.9	10.9	10.9	10.9	10.9	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	0.11226	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.06492	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.05658	14.9	14.9	14.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.06130	48.5	48.5	48.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**157.7**	**174.9**	**164.3**	**75.3**	**68.8**	**66.7**	**64.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.00154	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00004	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00154	4.1	4.1	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00154	2.7	2.7	2.7	2.7	2.7	2.7	2.7	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00154	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00154	0.5	0.5	0.5	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	3.3	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00154	81.2	81.2	81.2	81.2	81.2	81.2	81.2	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.6**	**0.6**	**0.6**	**0.3**	**0.3**	**0.3**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**93.6**	**92.4**	**92.4**	**86.0**	**86.0**	**86.0**	**86.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-H
Solar Array Construction Monthly Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.04847	0.0	0.0	0.0	0.0	0.0	4.8	4.8	14.4	28.8	28.8	28.8	28.8	28.8	28.8	28.8
Crane, 20-Ton, TR400	0.04591	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.03183	0.0	0.0	0.0	0.0	0.0	0.0	27.3	41.0	41.0	54.6	54.6	54.6	54.6	54.6	54.6
Welder, Multiquip, BLW-300SS	0.00703	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.9	3.7	3.7	5.6	5.6	5.6	5.6	5.6
Backhoe, Cat, 420E	0.05137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	6.8	6.8
Trencher, Cat 140G	0.07432	0.0	0.0	0.0	0.0	0.0	0.0	9.8	9.8	9.8	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.07616	0.0	0.0	0.0	0.0	0.0	0.0	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Scraper, CAT 657G, Tractor Engine	0.10328	0.0	72.7	72.7	72.7	72.7	72.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.05972	0.0	42.0	42.0	42.0	42.0	42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.05205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.7	13.7	13.7	13.7	13.7	13.7	13.7
Truck, Concrete Pump, International	0.05639	0.0	0.0	0.0	0.0	0.0	0.0	22.3	37.2	44.7	44.7	44.7	44.7	44.7	44.7	44.7
Construction Equipment Total		**0.0**	**114.8**	**114.8**	**114.8**	**114.8**	**119.6**	**76.2**	**114.3**	**151.7**	**155.6**	**157.4**	**157.4**	**164.2**	**164.2**	**164.2**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.00142	0.0	2.2	2.2	2.2	2.2	2.2	0.8	0.8	0.8	0.8	0.8	0.8	0.6	0.6	0.6
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Off-Site Cement Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.1	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Off-Site Dump Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Off-Site Water Trucks	0.00142	0.0	0.0	1.6	1.6	1.6	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Off-Site Construction Worker Commute	0.00003	0.2	0.2	1.5	1.5	1.5	2.3	3.0	3.8	5.3	6.8	8.3	12.8	13.6	11.3	6.8
Off-Site Tractor-Trailer	0.00142	0.0	0.0	0.0	0.0	0.0	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7
On-Site Motor Vehicle Total		**0.0**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.6**	**0.6**	**0.6**
Off-Site Motor Vehicle Total		**0.2**	**2.4**	**5.3**	**5.3**	**5.3**	**83.4**	**85.1**	**87.1**	**89.3**	**90.8**	**92.3**	**96.8**	**97.3**	**95.0**	**90.5**

Table 9-H (continued)
Solar Array Construction Monthly Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.04847	14.4	14.4	14.4	14.4	14.4	14.4	14.4	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04591	0.0	6.1	6.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.03183	41.0	41.0	41.0	27.3	27.3	27.3	27.3	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00703	5.6	5.6	5.6	5.6	5.6	3.7	1.9	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05137	6.8	6.8	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.07432	0.0	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.07616	10.1	10.1	10.1	10.1	10.1	10.1	10.1	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	0.10328	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.05972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.05205	13.7	13.7	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.05639	44.7	44.7	44.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**136.2**	**152.0**	**142.2**	**63.4**	**57.3**	**55.5**	**53.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.00142	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00004	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00142	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00142	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00142	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00142	0.5	0.5	0.5	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	3.0	1.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00142	74.7	74.7	74.7	74.7	74.7	74.7	74.7	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.6**	**0.6**	**0.6**	**0.3**	**0.3**	**0.3**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**86.7**	**85.6**	**85.6**	**79.4**	**79.4**	**79.4**	**79.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-I
Solar Array Construction Monthly Motor Vehicle Fugitive PM10 Emissions

Vehicle Type	Emission Factor (lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-site Vehicles																
On-Site Watering Truck	0.00	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Flatbed Truck	1.04	0.0	0.0	0.0	0.0	0.0	0.0	114.7	114.7	229.3	229.3	229.3	229.3	229.3	229.3	229.3
On-Site Pickup Truck	1.04	91.7	91.7	91.7	91.7	91.7	91.7	91.7	91.7	183.5	183.5	183.5	183.5	183.5	183.5	183.5
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00090	0.0	0.0	0.0	0.0	0.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Off-Site Cement Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.2	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Off-Site Dump Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Off-Site Pickup Trucks	0.00092	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Off-Site Pipe Hauling Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Off-Site Water Trucks	0.00100	0.0	0.0	1.1	1.1	1.1	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Construction Worker Commute	0.00092	6.1	6.1	48.5	48.5	48.5	72.7	96.9	121.2	169.6	218.1	266.5	411.9	436.1	363.5	218.1
Off-Site Tractor-Trailer	0.00100	0.0	0.0	0.0	0.0	0.0	52.9	52.9	52.9	52.9	52.9	52.9	52.9	52.9	52.9	52.9
On-Site Motor Vehicle Total		**91.7**	**92.0**	**92.0**	**92.0**	**92.0**	**92.0**	**206.5**	**206.5**	**412.8**	**412.8**	**412.8**	**412.8**	**412.8**	**412.8**	**412.8**
Off-Site Motor Vehicle Total		**6.1**	**6.1**	**50.4**	**50.4**	**50.4**	**147.8**	**173.7**	**198.8**	**247.7**	**296.1**	**344.6**	**490.0**	**514.2**	**441.5**	**296.1**

Table 9-I (continued)
Solar Array Construction Monthly Motor Vehicle Fugitive PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
On-site Vehicles													
On-Site Watering Truck	0.00	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	1.04	229.3	229.3	229.3	229.3	229.3	229.3	229.3	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	1.04	183.5	183.5	183.5	183.5	183.5	183.5	183.5	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00090	19.0	19.0	19.0	19.0	19.0	19.0	19.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00100	2.6	2.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00100	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00092	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00100	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00100	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	96.9	60.6	60.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00100	52.9	52.9	52.9	52.9	52.9	52.9	52.9	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**412.8**	**412.8**	**412.8**	**412.8**	**412.8**	**412.8**	**412.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**175.0**	**138.6**	**138.6**	**75.2**	**75.2**	**75.2**	**75.2**	**0.8**	**0.8**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-J
Solar Array Construction Monthly Motor Vehicle Fugitive PM2.5 Emissions

Vehicle Type	Emission Factor (lb/mile)	Monthly Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-site Vehicles																
On-Site Watering Truck	0.00	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.22	0.0	0.0	0.0	0.0	0.0	0.0	24.3	24.3	48.6	48.6	48.6	48.6	48.6	48.6	48.6
On-Site Pickup Truck	0.22	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	38.9	38.9	38.9	38.9	38.9	38.9	38.9
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00016	0.0	0.0	0.0	0.0	0.0	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Off-Site Cement Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Off-Site Dump Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Pickup Trucks	0.00017	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Water Trucks	0.00019	0.0	0.0	0.2	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Construction Worker Commute	0.00017	1.1	1.1	8.7	8.7	8.7	13.1	17.5	21.9	30.6	39.4	48.1	74.3	78.7	65.6	39.4
Off-Site Tractor-Trailer	0.00019	0.0	0.0	0.0	0.0	0.0	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
On-Site Motor Vehicle Total		**19.4**	**19.5**	**19.5**	**19.5**	**19.5**	**19.5**	**43.8**	**43.8**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**
Off-Site Motor Vehicle Total		**1.1**	**1.1**	**9.1**	**9.1**	**9.1**	**27.3**	**32.0**	**36.6**	**45.4**	**54.2**	**62.9**	**89.1**	**93.5**	**80.4**	**54.2**

Table 9-J (continued)
Solar Array Construction Monthly Motor Vehicle Fugitive PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/mile)	Monthly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
On-site Vehicles													
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.22	48.6	48.6	48.6	48.6	48.6	48.6	48.6	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.22	38.9	38.9	38.9	38.9	38.9	38.9	38.9	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00016	3.4	3.4	3.4	3.4	3.4	3.4	3.4	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00019	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00019	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00017	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00019	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00019	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	17.5	10.9	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00019	10.3	10.3	10.3	10.3	10.3	10.3	10.3	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**87.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**32.3**	**25.7**	**25.7**	**14.2**	**14.2**	**14.2**	**14.2**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-K
Solar Array Construction Monthly Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Month														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	Cu. Yd.	0	0	319,184	319,184	319,184	0	0	0	0	0	0	0	0	0	0
Storage Pile Wind Erosion[a]	Acres-Days	0.00	0.00	45.00	45.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bulldozing and Grading	Hours	704	704	704	704	704	132	132	132	132	132	132	132	132	132	132

Table 9-K (continued)
Solar Array Construction Monthly Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Day											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Excavation	Cu. Yd.	0	0	0	0	0	0	0	0	0	0	0	0
Storage Pile Wind Erosion[a]	Acres-Days	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bulldozing and Grading	Hours	132	132	132	132	132	132	0	0	0	0	0	0

[a] Based on 30 days per month

Table 9-L
Solar Array Construction Monthly Fugitive PM10 Emissions

Activity	Emission Factor	Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	9.94E-04	0.0	0.0	317.1	317.1	317.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	4.3	0.0	0.0	193.1	193.1	193.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.617	434.7	434.7	434.7	434.7	434.7	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5
Total		**434.7**	**434.7**	**945.0**	**945.0**	**945.0**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**

Table 9-L (continued)
Solar Array Construction Monthly Fugitive PM10 Emissions

Activity	Emission Factor	Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Excavation	9.94E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.617	81.5	81.5	81.5	81.5	81.5	81.5	0.0	0.0	0.0	0.0	0.0	0.0
Total		**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**81.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 9-M
Solar Array Construction Monthly Fugitive PM2.5 Emissions

Activity	Emission Factor	Emissions (lb/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	2.07E-04	0.0	0.0	66.0	66.0	66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.9	0.0	0.0	40.2	40.2	40.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.128	90.4	90.4	90.4	90.4	90.4	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
Total		**90.4**	**90.4**	**196.6**	**196.6**	**196.6**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**

Table 9-M (continued)
Solar Array Construction Monthly Fugitive PM2.5 Emissions

Activity	Emission Factor	Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Excavation	2.07E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.128	17.0	17.0	17.0	17.0	17.0	17.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**17.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 10-A

Combined Cycle Facility Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Hour	Monthly Number													
			Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	1	4	4	4	4	4	4	4	5	5	5	5	5	5	5
Asphalt Paver, Cat A-8008	Diesel	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Compactor, Cat CS-563	Diesel	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
Crane, 150-Ton, Manitowoc	Diesel	1	0	0	0	0	1	1	2	2	2	2	2	2	1	1
Crane, 20-Ton, TR400	Diesel	1	0	0	0	1	1	1	1	1	2	2	2	2	2	2
Crane, 225-Ton, Manitowoc, 4100W	Diesel	1	0	0	0	0	0	0	0	1	1	1	1	2	2	2
Crane, 40-Ton, Grove, TR700B	Diesel	1	0	0	1	1	1	2	2	2	2	2	2	3	3	4
Loader, Cat, 938F	Diesel	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trencher, Cat 140G	Diesel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Truck, Concrete Pump, International	Diesel	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1
Welder, Multiquip, BLW-300SS	Diesel	1	1	1	1	2	3	6	9	9	9	9	9	9	8	7
Welder, Multiquip, GA 3800	Gasoline	1	5	5	5	5	7	7	7	7	7	7	8	9	9	9
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	Gasoline	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
On-Site Fuel/Lube Truck	Gasoline	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2
On-Site Flatbed Truck	Gasoline	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
On-Site Watering Truck	Diesel	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
On-Site Dump Truck	Diesel	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	20	4	4	4	4	4	9	9	15	15	20	20	20	15	15
Off-Site Asphalt Trucks	Diesel	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Cement Trucks	Diesel	20	0	0	5	5	5	5	5	6	6	3	1	1	1	1
Off-Site Construction Worker Commute	Gasoline	30	129	148	167	185	204	252	263	267	269	272	272	285	272	259
Off-Site Dump Trucks	Diesel	20	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Low Boy Trucks	Diesel	15	0	0	0	0	5	5	5	5	5	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	20	5	5	5	5	5	5	7	12	12	10	10	10	10	10
Off-Site Pipe Hauling Trucks	Diesel	35	0	0	0	0	0	4	4	8	8	8	8	4	4	4
Off-Site Water Trucks	Diesel	5	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Off-Site Fuel/Lube Trucks	Gasoline	20	2	2	2	2	2	3	3	3	3	3	3	3	3	3

Table 10-A (continued)
Combined Cycle Facility Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Hour	Monthly Number												
			Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment															
Air Compressor, Ingersoll-Rand	Diesel	1	5	5	5	5	6	6	6	6	6	6	6	6	0
Asphalt Paver, Cat A-8008	Diesel	1	0	0	0	0	0	0	0	2	2	2	2	2	0
Backhoe, Cat, 420E	Diesel	1	1	1	1	1	1	1	1	1	0	0	0	0	0
Compactor, Cat CS-563	Diesel	1	0	0	0	0	0	0	1	1	1	1	1	1	0
Crane, 150-Ton, Manitowoc	Diesel	1	1	1	1	1	1	1	1	1	1	1	0	0	0
Crane, 20-Ton, TR400	Diesel	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Crane, 225-Ton, Manitowoc, 4100W	Diesel	1	2	1	1	1	1	1	1	0	0	0	0	0	0
Crane, 40-Ton, Grove, TR700B	Diesel	1	4	2	2	2	2	2	2	2	2	2	2	2	2
Loader, Cat, 938F	Diesel	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	1	6	6	6	6	5	5	5	5	5	5	5	5	5
Welder, Multiquip, GA 3800	Gasoline	1	9	9	9	9	9	9	9	8	8	8	8	8	8
Motor Vehicles															
On-site Vehicles															
On-Site Welding Truck	Gasoline	2	3	3	3	3	3	3	3	3	3	3	3	3	3
On-Site Fuel/Lube Truck	Gasoline	2	2	2	2	2	2	2	2	1	1	1	1	1	1
On-Site Flatbed Truck	Gasoline	2	3	3	3	3	3	3	3	3	3	3	3	3	3
On-Site Watering Truck	Diesel	5	1	1	1	1	1	1	1	1	1	1	1	1	1
On-Site Dump Truck	Diesel	2	2	2	2	2	1	1	1	1	1	1	1	1	1
Off-Site Vehicles															
Off-Site Flat Bed Trucks	Gasoline	20	10	10	10	5	5	1	1	1	1	1	1	1	1
Off-Site Asphalt Trucks	Diesel	20	0	0	0	0	0	0	0	2	2	2	2	2	2
Off-Site Cement Trucks	Diesel	20	1	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	30	227	210	184	181	167	166	152	126	118	106	105	104	99
Off-Site Dump Trucks	Diesel	20	2	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Low Boy Trucks	Diesel	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	20	10	5	5	5	5	5	5	5	5	5	3	3	3
Off-Site Pipe Hauling Trucks	Diesel	35	4	4	4	4	1	1	1	0	0	0	0	0	0
Off-Site Water Trucks	Diesel	5	2	2	2	2	2	2	2	1	1	1	1	1	1
Off-Site Fuel/Lube Trucks	Gasoline	20	3	3	2	2	2	2	2	2	2	2	2	2	2

Table 10-B
Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Maximum Hourly Operating Hours or Miles[a]														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5
Asphalt Paver, Cat A-8008	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1
Compactor, Cat CS-563	Diesel	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Crane, 150-Ton, Manitowoc	Diesel	0	0	0	0	1	1	2	2	2	2	2	2	1	1	1
Crane, 20-Ton, TR400	Diesel	0	0	0	1	1	1	1	1	2	2	2	2	2	2	2
Crane, 225-Ton, Manitowoc, 4100W	Diesel	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
Crane, 40-Ton, Grove, TR700B	Diesel	0	0	1	1	1	2	2	2	2	2	2	3	3	4	4
Loader, Cat, 938F	Diesel	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trencher, Cat 140G	Diesel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Truck, Concrete Pump, International	Diesel	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1
Welder, Multiquip, BLW-300SS	Diesel	1	1	1	2	3	6	9	9	9	9	9	9	8	7	6
Welder, Multiquip, GA 3800	Gasoline	5	5	5	5	7	7	7	7	7	7	8	9	9	9	9
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	Gasoline	4	4	4	4	4	4	4	4	4	4	6	6	6	6	6
On-Site Fuel/Lube Truck	Gasoline	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4
On-Site Flatbed Truck	Gasoline	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6
On-Site Watering Truck	Diesel	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
On-Site Dump Truck	Diesel	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	80	80	80	80	80	180	180	300	300	400	400	400	300	300	200
Off-Site Asphalt Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Cement Trucks	Diesel	0	0	100	100	100	100	100	120	120	60	20	20	20	20	20
Off-Site Construction Worker Commute	Gasoline	3,870	4,440	5,010	5,550	6,120	7,560	7,890	8,010	8,070	8,160	8,160	8,550	8,160	7,770	6,810
Off-Site Dump Trucks	Diesel	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Off-Site Low Boy Trucks	Diesel	0	0	0	0	75	75	75	75	75	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	100	100	100	100	100	100	140	240	240	200	200	200	200	200	200
Off-Site Pipe Hauling Trucks	Diesel	0	0	0	0	0	140	140	280	280	280	280	140	140	140	140
Off-Site Water Trucks	Diesel	5	5	5	5	5	5	5	5	10	10	10	10	10	10	10
Off-Site Fuel/Lube Trucks	Gasoline	40	40	40	40	40	60	60	60	60	60	60	60	60	60	60

Table 10-B (continued)
Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Maximum Hourly Operating Hours or Miles											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	Diesel	5	5	5	6	6	6	6	6	6	6	6	0
Asphalt Paver, Cat A-8008	Diesel	0	0	0	0	0	0	2	2	2	2	2	0
Backhoe, Cat, 420E	Diesel	1	1	1	1	1	1	1	0	0	0	0	0
Compactor, Cat CS-563	Diesel	0	0	0	0	0	1	1	1	1	1	1	0
Crane, 150-Ton, Manitowoc	Diesel	1	1	1	1	1	1	1	1	1	0	0	0
Crane, 20-Ton, TR400	Diesel	2	2	2	2	2	2	2	2	2	2	2	2
Crane, 225-Ton, Manitowoc, 4100W	Diesel	1	1	1	1	1	1	0	0	0	0	0	0
Crane, 40-Ton, Grove, TR700B	Diesel	2	2	2	2	2	2	2	2	2	2	2	2
Loader, Cat, 938F	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	1	1	0	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	1	1	1	1	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	6	6	6	5	5	5	5	5	5	5	5	5
Welder, Multiquip, GA 3800	Gasoline	9	9	9	9	9	9	8	8	8	8	8	8
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	Gasoline	6	6	6	6	6	6	6	6	6	6	6	6
On-Site Fuel/Lube Truck	Gasoline	4	4	4	4	4	4	2	2	2	2	2	2
On-Site Flatbed Truck	Gasoline	6	6	6	6	6	6	6	6	6	6	6	6
On-Site Watering Truck	Diesel	5	5	5	5	5	5	5	5	5	5	5	5
On-Site Dump Truck	Diesel	4	4	4	2	2	2	2	2	2	2	2	2
Off-Site Vehicles													
Off-Site Flat Bed Trucks	Gasoline	200	200	100	100	20	20	20	20	20	20	20	20
Off-Site Asphalt Trucks	Diesel	0	0	0	0	0	0	40	40	40	40	40	40
Off-Site Cement Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	6,300	5,520	5,430	5,010	4,980	4,560	3,780	3,540	3,180	3,150	3,120	2,970
Off-Site Dump Trucks	Diesel	40	40	40	40	40	40	40	40	40	40	40	40
Off-Site Low Boy Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	100	100	100	100	100	100	100	100	100	60	60	60
Off-Site Pipe Hauling Trucks	Diesel	140	140	140	35	35	35	0	0	0	0	0	0
Off-Site Water Trucks	Diesel	10	10	10	10	10	10	5	5	5	5	5	5
Off-Site Fuel/Lube Trucks	Gasoline	60	40	40	40	40	40	40	40	40	40	40	40

Table 10-C
Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle CO Emissions

		Maxum Hourly Emissions (lb/hr)														
Equipment/Vehicle Type	**Emission Factor (lb/hr or lb/mile)**	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**	**Month 13**	**Month 14**	**Month 15**
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.3302	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Asphalt Paver, Cat A-8008	0.5282	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.3664	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.4	0.4	0.4	0.4	0.4
Compactor, Cat CS-563	0.6294	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.3642	0.0	0.0	0.0	0.0	0.4	0.4	0.7	0.7	0.7	0.7	0.7	0.7	0.4	0.4	0.4
Crane, 20-Ton, TR400	0.3642	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Crane, 225-Ton, Manitowoc, 4100W	0.7101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.7	1.4	1.4	1.4	1.4
Crane, 40-Ton, Grove, TR700B	0.3642	0.0	0.0	0.4	0.4	0.4	0.7	0.7	0.7	0.7	0.7	0.7	1.1	1.1	1.5	1.5
Loader, Cat, 938F	0.6348	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.7439	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Trencher, Cat 140G	0.4892	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Truck, Concrete Pump, International	0.4516	0.5	0.9	0.9	0.9	0.9	0.9	0.9	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Welder, Multiquip, BLW-300SS	0.0651	0.1	0.1	0.1	0.1	0.2	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4
Welder, Multiquip, GA 3800	3.6411	18.2	18.2	18.2	18.2	25.5	25.5	25.5	25.5	25.5	25.5	29.1	32.8	32.8	32.8	32.8
Construction Equipment Total		**23.3**	**23.7**	**24.1**	**24.5**	**32.2**	**32.2**	**32.7**	**32.7**	**33.0**	**33.0**	**36.3**	**41.0**	**40.6**	**40.9**	**40.8**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.0100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
On-Site Fuel/Lube Truck	0.0100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0660	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
On-Site Watering Truck	0.0104	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Dump Truck	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0100	0.8	0.8	0.8	0.8	0.8	1.8	1.8	3.0	3.0	4.0	4.0	4.0	3.0	3.0	2.0
Off-Site Asphalt Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0104	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	0.6	0.2	0.2	0.2	0.2	0.2
Off-Site Construction Worker Commute	0.0087	33.8	38.7	43.7	48.4	53.4	65.9	68.8	69.9	70.4	71.2	71.2	74.6	71.2	67.8	59.4
Off-Site Dump Trucks	0.0104	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Low Boy Trucks	0.0104	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0087	0.9	0.9	0.9	0.9	0.9	0.9	1.2	2.1	2.1	1.7	1.7	1.7	1.7	1.7	1.7
Off-Site Pipe Hauling Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	1.5	1.5	2.9	2.9	2.9	2.9	1.5	1.5	1.5	1.5
Off-Site Water Trucks	0.0104	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Fuel/Lube Trucks	0.0100	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
On-Site Motor Vehicle Total		**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Off-Site Motor Vehicle Total		**36.3**	**41.3**	**47.3**	**52.0**	**57.7**	**72.9**	**76.2**	**80.9**	**81.5**	**81.6**	**81.1**	**83.1**	**78.7**	**75.3**	**65.9**

Table 10-C (continued)

Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.3302	1.7	1.7	1.7	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Asphalt Paver, Cat A-8008	0.5282	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	0.0
Backhoe, Cat, 420E	0.3664	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.6294	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.0
Crane, 150-Ton, Manitowoc	0.3642	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.3642	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Crane, 225-Ton, Manitowoc, 4100W	0.7101	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.3642	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Loader, Cat, 938F	0.6348	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.7439	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.4892	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.4516	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.0651	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Welder, Multiquip, GA 3800	3.6411	32.8	32.8	32.8	32.8	32.8	32.8	29.1	29.1	29.1	29.1	29.1	29.1
Construction Equipment Total		**38.9**	**38.9**	**38.2**	**38.5**	**38.0**	**38.6**	**35.3**	**34.9**	**34.9**	**34.6**	**34.6**	**30.9**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.0100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Fuel/Lube Truck	0.0100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0660	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
On-Site Watering Truck	0.0104	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Dump Truck	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0100	2.0	2.0	1.0	1.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Asphalt Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Cement Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0087	54.9	48.1	47.4	43.7	43.4	39.8	33.0	30.9	27.7	27.5	27.2	25.9
Off-Site Dump Trucks	0.0104	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Low Boy Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0087	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.5	0.5	0.5
Off-Site Pipe Hauling Trucks	0.0104	1.5	1.5	1.5	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.0104	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Fuel/Lube Trucks	0.0100	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
On-Site Motor Vehicle Total		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Off-Site Motor Vehicle Total		**60.4**	**53.4**	**51.6**	**46.8**	**45.8**	**42.1**	**35.3**	**33.2**	**30.1**	**29.5**	**29.2**	**27.9**

Note: Totals may not match sum of individual values because of rounding.

Table 10-D
Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.0986	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Asphalt Paver, Cat A-8008	0.1731	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.1000	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Compactor, Cat CS-563	0.1567	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.1310	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1
Crane, 20-Ton, TR400	0.1310	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Crane, 225-Ton, Manitowoc, 4100W	0.1906	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.4
Crane, 40-Ton, Grove, TR700B	0.1310	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5
Loader, Cat, 938F	0.1573	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.1857	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Trencher, Cat 140G	0.1593	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Truck, Concrete Pump, International	0.1723	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Welder, Multiquip, BLW-300SS	0.0249	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Welder, Multiquip, GA 3800	0.1273	0.6	0.6	0.6	0.6	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.1
Construction Equipment Total		**2.1**	**2.3**	**2.4**	**2.5**	**3.0**	**3.0**	**3.2**	**3.2**	**3.3**	**3.3**	**3.3**	**3.8**	**3.6**	**3.7**	**3.7**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.0010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.0010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0040	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0010	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.2
Off-Site Asphalt Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0025	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0008	3.1	3.6	4.0	4.4	4.9	6.1	6.3	6.4	6.5	6.5	6.5	6.9	6.5	6.2	5.5
Off-Site Dump Trucks	0.0025	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Low Boy Trucks	0.0025	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0008	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Pipe Hauling Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.7	0.7	0.7	0.7	0.3	0.3	0.3	0.3
Off-Site Water Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.0010	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Off-Site Motor Vehicle Total		**3.4**	**3.9**	**4.6**	**5.0**	**5.6**	**7.3**	**7.6**	**8.3**	**8.3**	**8.1**	**8.0**	**8.0**	**7.6**	**7.3**	**6.4**

Table 10-D (continued)

Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.0986	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0
Asphalt Paver, Cat A-8008	0.1731	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.0
Backhoe, Cat, 420E	0.1000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.1567	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Crane, 150-Ton, Manitowoc	0.1310	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.1310	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Crane, 225-Ton, Manitowoc, 4100W	0.1906	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.1310	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Loader, Cat, 938F	0.1573	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.1857	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.1593	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.1723	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.0249	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Welder, Multiquip, GA 3800	0.1273	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0
Construction Equipment Total		**3.1**	**3.1**	**2.9**	**3.0**	**2.8**	**3.0**	**3.0**	**2.9**	**2.9**	**2.8**	**2.8**	**1.7**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.0010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.0010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0040	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0010	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Cement Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0008	5.0	4.4	4.4	4.0	4.0	3.7	3.0	2.8	2.5	2.5	2.5	2.4
Off-Site Dump Trucks	0.0025	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Low Boy Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0008	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0025	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.0010	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**5.9**	**5.2**	**5.0**	**4.4**	**4.3**	**4.0**	**3.4**	**3.2**	**2.9**	**2.8**	**2.8**	**2.7**

Note: Totals may not match sum of individual values because of rounding.

Table 10-E
Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.5945	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Asphalt Paver, Cat A-8008	1.0144	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.6082	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.6	0.6	0.6	0.6	0.6
Compactor, Cat CS-563	1.2714	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	1.3109	0.0	0.0	0.0	0.0	1.3	1.3	2.6	2.6	2.6	2.6	2.6	2.6	1.3	1.3	1.3
Crane, 20-Ton, TR400	1.3109	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Crane, 225-Ton, Manitowoc, 4100W	1.8726	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.9	1.9	1.9	3.7	3.7	3.7	3.7
Crane, 40-Ton, Grove, TR700B	1.3109	0.0	0.0	1.3	1.3	1.3	2.6	2.6	2.6	2.6	2.6	2.6	3.9	3.9	5.2	5.2
Loader, Cat, 938F	1.2278	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	1.4427	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Trencher, Cat 140G	0.9488	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Truck, Concrete Pump, International	1.7369	1.7	3.5	3.5	3.5	3.5	3.5	3.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Welder, Multiquip, BLW-300SS	0.1085	0.1	0.1	0.1	0.2	0.3	0.7	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.7
Welder, Multiquip, GA 3800	0.0533	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
Construction Equipment Total		**10.6**	**12.3**	**13.6**	**15.1**	**16.6**	**17.0**	**18.6**	**18.1**	**19.4**	**19.4**	**18.9**	**22.1**	**20.7**	**21.9**	**21.8**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.0014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.0014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Watering Truck	0.0370	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
On-Site Dump Truck	0.0370	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0014	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.4	0.6	0.6	0.6	0.4	0.4	0.3
Off-Site Asphalt Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0370	0.0	0.0	3.7	3.7	3.7	3.7	3.7	4.4	4.4	2.2	0.7	0.7	0.7	0.7	0.7
Off-Site Construction Worker Commute	0.0007	2.9	3.3	3.7	4.1	4.5	5.6	5.8	5.9	6.0	6.0	6.0	6.3	6.0	5.7	5.0
Off-Site Dump Trucks	0.0370	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Off-Site Low Boy Trucks	0.0370	0.0	0.0	0.0	0.0	2.8	2.8	2.8	2.8	2.8	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0007	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pipe Hauling Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	5.2	5.2	10.4	10.4	10.4	10.4	5.2	5.2	5.2	5.2
Off-Site Water Trucks	0.0370	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Fuel/Lube Trucks	0.0014	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Motor Vehicle Total		**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Off-Site Motor Vehicle Total		**4.8**	**5.2**	**9.3**	**9.7**	**12.9**	**19.3**	**19.6**	**25.9**	**26.1**	**21.3**	**19.8**	**14.9**	**14.5**	**14.2**	**13.3**

Table 10-E (continued)

Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.5945	3.0	3.0	3.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0.0
Asphalt Paver, Cat A-8008	1.0144	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
Backhoe, Cat, 420E	0.6082	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	1.2714	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0
Crane, 150-Ton, Manitowoc	1.3109	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0
Crane, 20-Ton, TR400	1.3109	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Crane, 225-Ton, Manitowoc, 4100W	1.8726	1.9	1.9	1.9	1.9	1.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	1.3109	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Loader, Cat, 938F	1.2278	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	1.4427	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.9488	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	1.7369	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.1085	0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Welder, Multiquip, GA 3800	0.0533	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Construction Equipment Total		**15.5**	**15.5**	**14.1**	**14.6**	**13.6**	**14.9**	**15.0**	**14.4**	**14.4**	**13.1**	**13.1**	**6.2**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.0014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.0014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Watering Truck	0.0370	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
On-Site Dump Truck	0.0370	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0014	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5
Off-Site Cement Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0007	4.7	4.1	4.0	3.7	3.7	3.4	2.8	2.6	2.4	2.3	2.3	2.2
Off-Site Dump Trucks	0.0370	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Off-Site Low Boy Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0007	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0370	5.2	5.2	5.2	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.0370	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Fuel/Lube Trucks	0.0014	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Motor Vehicle Total		**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Off-Site Motor Vehicle Total		**12.1**	**11.5**	**11.3**	**7.1**	**7.0**	**6.7**	**6.1**	**5.9**	**5.7**	**5.6**	**5.6**	**5.5**

Note: Totals may not match sum of individual values because of rounding.

Table 10-F
Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.00055	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asphalt Paver, Cat A-8008	0.00081	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.00061	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.00122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.00126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.00126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 225-Ton, Manitowoc, 4100W	0.00177	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.00126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Loader, Cat, 938F	0.00120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.00139	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.00076	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.00187	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.00015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Low Boy Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 10-F (continued)

Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.00055	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asphalt Paver, Cat A-8008	0.00081	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.00061	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.00122	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.00126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.00126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 225-Ton, Manitowoc, 4100W	0.00177	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.00126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Loader, Cat, 938F	0.00120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.00139	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.00076	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.00187	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.00015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Low Boy Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 10-G

Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.05268	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Asphalt Paver, Cat A-8008	0.08908	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05583	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Compactor, Cat CS-563	0.06886	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.04990	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Crane, 225-Ton, Manitowoc, 4100W	0.07225	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Crane, 40-Ton, Grove, TR700B	0.04990	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Loader, Cat, 938F	0.07020	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.08278	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Trencher, Cat 140G	0.08078	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Truck, Concrete Pump, International	0.06130	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Welder, Multiquip, BLW-300SS	0.00764	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Welder, Multiquip, GA 3800	0.04210	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Construction Equipment Total		**0.9**	**1.0**	**1.0**	**1.1**	**1.2**	**1.2**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**1.5**	**1.4**	**1.5**	**1.5**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00154	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2
Off-Site Dump Trucks	0.00154	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Low Boy Trucks	0.00154	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2
Off-Site Water Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.2**	**0.2**	**0.4**	**0.4**	**0.5**	**0.8**	**0.8**	**1.1**	**1.1**	**0.9**	**0.8**	**0.6**	**0.6**	**0.6**	**0.5**

Table 10-G (continued)
Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.05268	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
Asphalt Paver, Cat A-8008	0.08908	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.0
Backhoe, Cat, 420E	0.05583	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.06886	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Crane, 150-Ton, Manitowoc	0.04990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04990	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Crane, 225-Ton, Manitowoc, 4100W	0.07225	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.04990	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Loader, Cat, 938F	0.07020	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.08278	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.08078	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.06130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00764	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.04210	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Construction Equipment Total		**1.2**	**1.2**	**1.1**	**1.2**	**1.1**	**1.2**	**1.2**	**1.2**	**1.2**	**1.1**	**1.1**	**0.6**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Cement Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Dump Trucks	0.00154	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Low Boy Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00154	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.5**	**0.5**	**0.5**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**

Note: Totals may not match sum of individual values because of rounding.

Table 10-H
Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.04847	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Asphalt Paver, Cat A-8008	0.08195	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05137	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Compactor, Cat CS-563	0.06335	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	0.04591	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04591	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Crane, 225-Ton, Manitowoc, 4100W	0.06647	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Crane, 40-Ton, Grove, TR700B	0.04591	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Loader, Cat, 938F	0.06458	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.07616	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Trencher, Cat 140G	0.07432	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Truck, Concrete Pump, International	0.05639	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Welder, Multiquip, BLW-300SS	0.00703	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Welder, Multiquip, GA 3800	0.03183	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Construction Equipment Total		**0.8**	**0.9**	**0.9**	**1.0**	**1.1**	**1.1**	**1.1**	**1.1**	**1.2**	**1.2**	**1.2**	**1.3**	**1.3**	**1.3**	**1.3**
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00142	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Dump Trucks	0.00142	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Low Boy Trucks	0.00142	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2
Off-Site Water Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.2**	**0.2**	**0.4**	**0.4**	**0.5**	**0.8**	**0.8**	**1.0**	**1.0**	**0.8**	**0.8**	**0.6**	**0.6**	**0.6**	**0.5**

Table 10-H (continued)
Combined Cycle Facility Construction Maximum Hourly Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.04847	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
Asphalt Paver, Cat A-8008	0.08195	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.0
Backhoe, Cat, 420E	0.05137	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	0.06335	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Crane, 150-Ton, Manitowoc	0.04591	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04591	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Crane, 225-Ton, Manitowoc, 4100W	0.06647	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	0.04591	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Loader, Cat, 938F	0.06458	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.07616	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.07432	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.05639	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00703	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.03183	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Construction Equipment Total		**1.1**	**1.1**	**1.0**	**1.0**	**1.0**	**1.0**	**1.1**	**1.0**	**1.0**	**1.0**	**1.0**	**0.5**
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Fuel/Lube Truck	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Watering Truck	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Cement Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Dump Trucks	0.00142	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Low Boy Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00142	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.5**	**0.5**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**

Note: Totals may not match sum of individual values because of rounding.

Table 10-I
Combined Cycle Facility Construction Maximum Hourly Motor Vehicle Fugitive PM10 Emissions

Vehicle Type	Emission Factor (lb/mile)	Maxum Hourly Emissions (lb/hr) Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-site Vehicles																
On-Site Welding Truck	1.04	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	6.3	6.3	6.3	6.3	6.3
On-Site Fuel/Lube Truck	1.04	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	4.2	4.2	4.2	4.2	4.2	4.2
On-Site Flatbed Truck	1.04	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	6.3	6.3	6.3	6.3	6.3	6.3	6.3
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	1.04	2.1	2.1	2.1	2.1	2.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00090	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.2
Off-Site Asphalt Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00100	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	3.6	4.1	4.6	5.1	5.6	6.9	7.2	7.4	7.4	7.5	7.5	7.8	7.5	7.1	6.3
Off-Site Dump Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Low Boy Trucks	0.00100	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00092	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Pipe Hauling Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1
Off-Site Water Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00090	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Motor Vehicle Total		**12.5**	**12.5**	**12.5**	**12.5**	**12.5**	**14.6**	**14.6**	**14.6**	**16.7**	**18.8**	**20.8**	**20.8**	**20.8**	**20.8**	**20.8**
Off-Site Motor Vehicle Total		**3.8**	**4.3**	**4.9**	**5.4**	**6.0**	**7.6**	**7.9**	**8.4**	**8.5**	**8.5**	**8.4**	**8.7**	**8.2**	**7.8**	**6.9**

Table 10-I (continued)
Combined Cycle Facility Construction Maximum Hourly Motor Vehicle Fugitive PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/mile)	Maximum Hourly Emissions (lb/hr) Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
On-site Vehicles													
On-Site Welding Truck	1.04	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
On-Site Fuel/Lube Truck	1.04	4.2	4.2	4.2	4.2	4.2	4.2	2.1	2.1	2.1	2.1	2.1	2.1
On-Site Flatbed Truck	1.04	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	1.04	4.2	4.2	4.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00090	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	5.8	5.1	5.0	4.6	4.6	4.2	3.5	3.2	2.9	2.9	2.9	2.7
Off-Site Dump Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Low Boy Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00092	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pipe Hauling Trucks	0.00100	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00090	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**20.8**	**20.8**	**20.8**	**18.8**	**18.8**	**18.8**	**16.7**	**16.7**	**16.7**	**16.7**	**16.7**	**16.7**
Off-Site Motor Vehicle Total		**6.3**	**5.6**	**5.4**	**4.9**	**4.8**	**4.4**	**3.7**	**3.5**	**3.1**	**3.1**	**3.1**	**2.9**

Note: Totals may not match sum of individual values because of rounding.

Table 10-J
Combined Cycle Facility Construction Maximum Hourly Motor Vehicle Fugitive PM2.5 Emissions

Vehicle Type	Emission Factor (lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-site Vehicles																
On-Site Welding Truck	0.22	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.3	1.3	1.3	1.3	1.3
On-Site Fuel/Lube Truck	0.22	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.9	0.9	0.9	0.9	0.9	0.9
On-Site Flatbed Truck	0.22	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.3	1.3	1.3	1.3	1.3	1.3	1.3
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.22	0.4	0.4	0.4	0.4	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	0.6	0.7	0.8	0.9	1.0	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.3	1.1
Off-Site Dump Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Low Boy Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00017	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**2.7**	**2.7**	**2.7**	**2.7**	**2.7**	**3.1**	**3.1**	**3.1**	**3.5**	**4.0**	**4.4**	**4.4**	**4.4**	**4.4**	**4.4**
Off-Site Motor Vehicle Total		**0.7**	**0.8**	**0.9**	**1.0**	**1.1**	**1.4**	**1.4**	**1.5**	**1.5**	**1.5**	**1.5**	**1.6**	**1.5**	**1.4**	**1.2**

Table 10-J (continued)
Combined Cycle Facility Construction Maximum Hourly Motor Vehicle Fugitive PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/mile)	Maximum Hourly Emissions (lb/hr)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
On-site Vehicles													
On-Site Welding Truck	0.22	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
On-Site Fuel/Lube Truck	0.22	0.9	0.9	0.9	0.9	0.9	0.9	0.4	0.4	0.4	0.4	0.4	0.4
On-Site Flatbed Truck	0.22	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Dump Truck	0.22	0.9	0.9	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Asphalt Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	1.0	0.9	0.9	0.8	0.8	0.8	0.6	0.6	0.5	0.5	0.5	0.5
Off-Site Dump Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Low Boy Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00017	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Fuel/Lube Trucks	0.00016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**4.4**	**4.4**	**4.4**	**4.0**	**4.0**	**4.0**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**
Off-Site Motor Vehicle Total		**1.1**	**1.0**	**1.0**	**0.9**	**0.9**	**0.8**	**0.7**	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**

Note: Totals may not match sum of individual values because of rounding.

Table 10-K
Combined Cycle Facility Construction Maximum Hourly Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Hour														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	Cu. Yd.	1,478	1,478	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Pile Wind Erosion[a]	Acre-Hours	1.50	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bulldozing and Grading	Hours	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 10-K (continued)
Combined Cycle Facility Construction Maximum Hourly Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Hour											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Excavation	Cu. Yd.	0	0	0	0	0	0	0	0	0	0	0	0
Storage Pile Wind Erosion[a]	Acre-Hours	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bulldozing and Grading	Hours	1	1	0	0	0	0	0	0	0	0	0	0

[a] Based on 30 days per month

Table 10-L
Combined Cycle Facility Construction Maximum Hourly Fugitive PM10 Emissions

Activity	Emission Factor	Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	9.94E-04	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.179	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.617	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Total		**2.4**	**2.4**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**

Table 10-L (continued)
Combined Cycle Facility Construction Maximum Hourly Fugitive PM10 Emissions

Activity	Emission Factor	Emissions (lb/hr)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Excavation	9.94E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.179	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.617	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		**0.6**	**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 10-M
Combined Cycle Facility Construction Maximum Hourly Fugitive PM2.5 Emissions

Activity	Emission Factor	Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	2.07E-04	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.037	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.128	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total		**0.5**	**0.5**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**

Table 10-M (continued)
Combined Cycle Facility Construction Maximum Hourly Fugitive PM2.5 Emissions

Activity	Emission Factor	Emissions (lb/hr)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Excavation	2.07E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.037	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.128	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 11-A
Solar Array Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Hour	Monthly Number													
			Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	1	0	0	0	0	0	1	1	3	6	6	6	6	6	6
Crane, 20-Ton, TR400	Diesel	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	1	0	0	0	0	0	0	6	9	9	12	12	12	12	12
Welder, Multiquip, BLW-300SS	Diesel	1	0	0	0	0	0	0	2	2	4	4	6	6	6	6
Backhoe, Cat, 420E	Diesel	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Trencher, Cat 140G	Diesel	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Scraper, CAT 657G, Tractor Engine	Diesel	1	0	4	4	4	4	4	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	1	0	4	4	4	4	4	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	1	0	0	0	0	0	0	0	0	2	2	2	2	2	2
Truck, Concrete Pump, International	Diesel	1	0	0	0	0	0	0	3	5	6	6	6	6	6	6
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	Diesel	4	0	8	8	8	8	8	3	3	3	3	3	3	2	2
On-Site Flatbed Truck	Gasoline	2	0	0	0	0	0	0	1	1	2	2	2	2	2	2
On-Site Pickup Truck	Gasoline	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	35	0	0	0	0	0	6	6	6	6	6	6	6	6	6
Off-Site Cement Trucks	Diesel	20	0	0	0	0	0	0	3	5	6	6	6	6	6	6
Off-Site Dump Trucks	Diesel	35	0	0	0	0	0	2	2	2	2	2	2	2	2	2
Off-Site Pickup Trucks	Gasoline	20	0	0	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Pipe Hauling Trucks	Diesel	14	0	0	0	0	0	2	2	2	2	2	2	2	2	2
Off-Site Water Trucks	Diesel	5	0	0	10	10	10	0	3	3	3	3	3	3	3	3
Off-Site Construction Worker Commute	Gasoline	35	5	5	40	40	40	60	80	100	140	180	220	340	360	300
Off-Site Tractor-Trailer	Diesel	35	0	0	0	0	0	12	12	12	12	12	12	12	12	12

Table 11-A (continued)
Solar Array Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Hour	Monthly Number												
			Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment															
Air Compressor, Ingersoll-Rand	Diesel	1	6	3	3	3	3	3	3	3	0	0	0	0	0
Crane, 20-Ton, TR400	Diesel	1	0	0	1	1	1	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	1	12	9	9	9	6	6	6	6	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	1	6	6	6	6	6	6	4	2	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	1	1	1	1	1	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	1	1	1	1	1	1	1	1	1	0	0	0	0	0
Scraper, CAT 657G, Tractor Engine	Diesel	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	1	2	2	2	2	0	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	1	6	6	6	6	0	0	0	0	0	0	0	0	0
Motor Vehicles															
On-site Vehicles															
On-Site Watering Truck	Diesel	4	2	2	2	2	1	1	1	1	0	0	0	0	0
On-Site Flatbed Truck	Gasoline	2	2	2	2	2	2	2	2	2	0	0	0	0	0
On-Site Pickup Truck	Gasoline	2	2	2	2	2	2	2	2	2	0	0	0	0	0
Off-Site Vehicles															
Off-Site Flat Bed Trucks	Gasoline	35	10	10	10	5	5	1	1	1	1	1	1	1	1
Off-Site Cement Trucks	Diesel	20	0	0	0	0	0	0	0	2	2	2	2	2	2
Off-Site Dump Trucks	Diesel	35	1	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	20	227	210	184	181	167	166	152	126	118	106	105	104	99
Off-Site Pipe Hauling Trucks	Diesel	14	2	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Water Trucks	Diesel	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	35	10	5	5	5	5	5	5	5	5	5	3	3	3
Off-Site Tractor-Trailer	Diesel	35	4	4	4	4	1	1	1	0	0	0	0	0	0

Table 11-B
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle Use

		Maximum Hourly Operating Hours or Miles[a]														
Equipment/Vehicle Type	**Fuel**	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**	**Month 13**	**Month 14**	**Month 15**
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	0	0	0	0	0	1	1	3	6	6	6	6	6	6	6
Crane, 20-Ton, TR400	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	0	0	0	0	0	0	6	9	9	12	12	12	12	12	12
Welder, Multiquip, BLW-300SS	Diesel	0	0	0	0	0	0	2	2	4	4	6	6	6	6	6
Backhoe, Cat, 420E	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Trencher, Cat 140G	Diesel	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
Scraper, CAT 657G, Tractor Engine	Diesel	0	4	4	4	4	4	0	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	0	4	4	4	4	4	0	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2
Truck, Concrete Pump, International	Diesel	0	0	0	0	0	0	3	5	6	6	6	6	6	6	6
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	Diesel	0	32	32	32	32	32	12	12	12	12	12	12	8	8	8
On-Site Flatbed Truck	Gasoline	0	0	0	0	0	0	2	2	4	4	4	4	4	4	4
On-Site Pickup Truck	Gasoline	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	0	0	0	0	0	210	210	210	210	210	210	210	210	210	350
Off-Site Cement Trucks	Diesel	0	0	0	0	0	0	60	100	120	120	120	120	120	120	0
Off-Site Dump Trucks	Diesel	0	0	0	0	0	70	70	70	70	70	70	70	70	70	35
Off-Site Pickup Trucks	Gasoline	0	0	40	40	40	40	40	40	40	40	40	40	40	40	4,540
Off-Site Pipe Hauling Trucks	Diesel	0	0	0	0	0	28	28	28	28	28	28	28	28	28	28
Off-Site Water Trucks	Diesel	0	0	50	50	50	0	15	15	15	15	15	15	15	15	0
Off-Site Construction Worker Commute	Gasoline	175	175	1,400	1,400	1,400	2,100	2,800	3,500	4,900	6,300	7,700	11,900	12,600	10,500	350
Off-Site Tractor-Trailer	Diesel	0	0	0	0	0	420	420	420	420	420	420	420	420	420	140

Table 11-B (continued)
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Maximum Hourly Operating Hours or Miles											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	Diesel	3	3	3	3	3	3	3	0	0	0	0	0
Crane, 20-Ton, TR400	Diesel	0	1	1	1	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	9	9	9	6	6	6	6	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	6	6	6	6	6	4	2	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	1	1	1	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	0	1	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	1	1	1	1	1	1	1	0	0	0	0	0
Scraper, CAT 657G, Tractor Engine	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	2	2	2	0	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	6	6	6	0	0	0	0	0	0	0	0	0
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	Diesel	8	8	8	4	4	4	4	0	0	0	0	0
On-Site Flatbed Truck	Gasoline	4	4	4	4	4	4	4	0	0	0	0	0
On-Site Pickup Truck	Gasoline	4	4	4	4	4	4	4	0	0	0	0	0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	Gasoline	350	350	175	175	35	35	35	35	35	35	35	35
Off-Site Cement Trucks	Diesel	0	0	0	0	0	0	40	40	40	40	40	40
Off-Site Dump Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	4,200	3,680	3,620	3,340	3,320	3,040	2,520	2,360	2,120	2,100	2,080	1,980
Off-Site Pipe Hauling Trucks	Diesel	28	28	28	28	28	28	28	28	28	28	28	28
Off-Site Water Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	175	175	175	175	175	175	175	175	175	105	105	105
Off-Site Tractor-Trailer	Diesel	140	140	140	35	35	35	0	0	0	0	0	0

Table 11-C
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.3302	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Crane, 20-Ton, TR400	0.3642	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	3.6411	0.0	0.0	0.0	0.0	0.0	0.0	21.8	32.8	32.8	43.7	43.7	43.7	43.7	43.7	43.7
Welder, Multiquip, BLW-300SS	0.0651	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Backhoe, Cat, 420E	0.3664	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4
Trencher, Cat 140G	0.4892	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.7439	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Scraper, CAT 657G, Tractor Engine	1.0062	0.0	4.0	4.0	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.5818	0.0	2.3	2.3	2.3	2.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.4902	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Truck, Concrete Pump, International	0.4516	0.0	0.0	0.0	0.0	0.0	0.0	1.4	2.3	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Construction Equipment Total		**0.0**	**6.4**	**6.4**	**6.4**	**6.4**	**6.7**	**24.9**	**37.4**	**39.9**	**50.4**	**50.5**	**50.5**	**50.9**	**50.9**	**50.9**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.0104	0.0	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Flatbed Truck	0.0660	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3
On-Site Pickup Truck	0.0087	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0100	0.0	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.5
Off-Site Cement Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.0	1.2	1.2	1.2	1.2	1.2	1.2	0.0
Off-Site Dump Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.4
Off-Site Pickup Trucks	0.0087	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	39.6
Off-Site Pipe Hauling Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Water Trucks	0.0104	0.0	0.0	0.5	0.5	0.5	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Off-Site Construction Worker Commute	0.0087	1.5	1.5	12.2	12.2	12.2	18.3	24.4	30.5	42.7	54.9	67.2	103.8	109.9	91.6	3.1
Off-Site Tractor-Trailer	0.0104	0.0	0.0	0.0	0.0	0.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	1.5
On-Site Motor Vehicle Total		**0.0**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Off-Site Motor Vehicle Total		**1.5**	**1.5**	**13.1**	**13.1**	**13.1**	**26.1**	**33.0**	**39.6**	**52.0**	**64.2**	**76.4**	**113.0**	**119.1**	**100.8**	**48.2**

Table 11-C (continued)
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.3302	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.3642	0.0	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	3.6411	32.8	32.8	32.8	21.8	21.8	21.8	21.8	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.0651	0.4	0.4	0.4	0.4	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.3664	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.4892	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.7439	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	1.0062	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.5818	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.4902	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.4516	2.7	2.7	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**39.0**	**39.8**	**39.3**	**24.3**	**24.0**	**23.8**	**23.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.0104	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0660	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.0087	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0100	3.5	3.5	1.7	1.7	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Cement Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Dump Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0087	36.6	32.1	31.6	29.1	29.0	26.5	22.0	20.6	18.5	18.3	18.1	17.3
Off-Site Pipe Hauling Trucks	0.0104	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Water Trucks	0.0104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0087	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.9	0.9	0.9
Off-Site Tractor-Trailer	0.0104	1.5	1.5	1.5	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**43.4**	**38.9**	**36.6**	**33.1**	**31.5**	**29.0**	**24.6**	**23.2**	**21.1**	**20.3**	**20.1**	**19.2**

Note: Totals may not match sum of individual values because of rounding.

Table 11-D
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.0986	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Crane, 20-Ton, TR400	0.1310	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.1273	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.1	1.1	1.5	1.5	1.5	1.5	1.5	1.5
Welder, Multiquip, BLW-300SS	0.0249	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Backhoe, Cat, 420E	0.1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Trencher, Cat 140G	0.1593	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.1857	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Scraper, CAT 657G, Tractor Engine	0.2959	0.0	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.1711	0.0	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.1281	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Truck, Concrete Pump, International	0.1723	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Construction Equipment Total		**0.0**	**1.9**	**1.9**	**1.9**	**1.9**	**2.0**	**1.8**	**2.7**	**3.5**	**3.7**	**3.7**	**3.7**	**3.8**	**3.8**	**3.8**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.0025	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0040	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.0008	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0010	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Off-Site Cement Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.0
Off-Site Dump Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Off-Site Pickup Trucks	0.0008	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6
Off-Site Pipe Hauling Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Water Trucks	0.0025	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0008	0.1	0.1	1.1	1.1	1.1	1.7	2.2	2.8	3.9	5.0	6.2	9.5	10.1	8.4	0.3
Off-Site Tractor-Trailer	0.0025	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.3
On-Site Motor Vehicle Total		**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.1**	**0.1**	**1.3**	**1.3**	**1.3**	**3.2**	**4.0**	**4.6**	**5.8**	**6.9**	**8.0**	**11.4**	**12.0**	**10.3**	**4.8**

Table 11-D (continued)
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.0986	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.1310	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.1273	1.1	1.1	1.1	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.0249	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.1000	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.1593	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.1857	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	0.2959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.1711	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.1281	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.1723	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**3.2**	**3.5**	**3.3**	**1.5**	**1.4**	**1.3**	**1.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0040	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.0008	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0010	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Dump Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0008	3.4	2.9	2.9	2.7	2.7	2.4	2.0	1.9	1.7	1.7	1.7	1.6
Off-Site Pipe Hauling Trucks	0.0025	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Water Trucks	0.0025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0008	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Tractor-Trailer	0.0025	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**4.3**	**3.8**	**3.6**	**3.1**	**3.0**	**2.8**	**2.4**	**2.2**	**2.0**	**2.0**	**2.0**	**1.9**

Note: Totals may not match sum of individual values because of rounding.

Table 11-E
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.5945	0.0	0.0	0.0	0.0	0.0	0.6	0.6	1.8	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Crane, 20-Ton, TR400	1.3109	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.0533	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
Welder, Multiquip, BLW-300SS	0.1085	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.4	0.7	0.7	0.7	0.7	0.7
Backhoe, Cat, 420E	0.6082	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6
Trencher, Cat 140G	0.9488	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	1.4427	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Scraper, CAT 657G, Tractor Engine	2.4463	0.0	9.8	9.8	9.8	9.8	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	1.4146	0.0	5.7	5.7	5.7	5.7	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.9859	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Truck, Concrete Pump, International	1.7369	0.0	0.0	0.0	0.0	0.0	0.0	5.2	8.7	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Construction Equipment Total		**0.0**	**15.4**	**15.4**	**15.4**	**15.4**	**16.0**	**8.7**	**13.6**	**19.3**	**18.5**	**18.7**	**18.7**	**19.3**	**19.3**	**19.3**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.0370	0.0	1.2	1.2	1.2	1.2	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
On-Site Flatbed Truck	0.0100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.0007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0014	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5
Off-Site Cement Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	2.2	3.7	4.4	4.4	4.4	4.4	4.4	4.4	0.0
Off-Site Dump Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	1.3
Off-Site Pickup Trucks	0.0007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
Off-Site Pipe Hauling Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Off-Site Water Trucks	0.0370	0.0	0.0	1.8	1.8	1.8	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0
Off-Site Construction Worker Commute	0.0007	0.1	0.1	1.0	1.0	1.0	1.6	2.1	2.6	3.6	4.7	5.7	8.8	9.3	7.8	0.3
Off-Site Tractor-Trailer	0.0370	0.0	0.0	0.0	0.0	0.0	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	5.2
On-Site Motor Vehicle Total		**0.0**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.3**	**0.3**	**0.3**
Off-Site Motor Vehicle Total		**0.1**	**0.1**	**2.9**	**2.9**	**2.9**	**21.0**	**24.3**	**26.3**	**28.1**	**29.1**	**30.2**	**33.3**	**33.8**	**32.3**	**11.6**

Table 11-E (continued)
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.5945	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	1.3109	0.0	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.0533	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.1085	0.7	0.7	0.7	0.7	0.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.6082	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.9488	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	1.4427	1.4	1.4	1.4	1.4	1.4	1.4	1.4	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	2.4463	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	1.4146	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.9859	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	1.7369	10.4	10.4	10.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**17.4**	**19.6**	**18.7**	**5.5**	**4.2**	**4.0**	**3.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.0370	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.0007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0014	0.5	0.5	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5
Off-Site Dump Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0007	3.1	2.7	2.7	2.5	2.5	2.2	1.9	1.7	1.6	1.6	1.5	1.5
Off-Site Pipe Hauling Trucks	0.0370	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Off-Site Water Trucks	0.0370	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0007	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Tractor-Trailer	0.0370	5.2	5.2	5.2	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**9.9**	**9.6**	**9.3**	**5.2**	**5.0**	**4.8**	**4.6**	**4.4**	**4.3**	**4.2**	**4.2**	**4.1**

Note: Totals may not match sum of individual values because of rounding.

Table 11-F
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.00055	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.00126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.00015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.00061	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.00076	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.00139	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	0.00558	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.00315	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.00090	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.00187	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**

Table 11-F (continued)
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.00055	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.00126	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.00015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.00061	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.00076	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.00139	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	0.00558	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.00315	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.00090	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.00187	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 11-G
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.05268	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Crane, 20-Ton, TR400	0.04990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.04210	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Welder, Multiquip, BLW-300SS	0.00764	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05583	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Trencher, Cat 140G	0.08078	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.08278	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Scraper, CAT 657G, Tractor Engine	0.11226	0.0	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.06492	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.05658	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Truck, Concrete Pump, International	0.06130	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Construction Equipment Total		**0.0**	**0.7**	**0.7**	**0.7**	**0.7**	**0.8**	**0.7**	**1.0**	**1.4**	**1.4**	**1.4**	**1.4**	**1.5**	**1.5**	**1.5**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Off-Site Dump Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Off-Site Pipe Hauling Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00154	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.0
Off-Site Tractor-Trailer	0.00154	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.2
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.9**	**1.0**	**1.1**	**1.2**	**1.2**	**1.3**	**1.4**	**1.4**	**1.3**	**0.5**

Table 11-G (continued)
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.05268	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.04210	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00764	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05583	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.08078	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.08278	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	0.11226	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.06492	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.05658	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.06130	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**1.2**	**1.3**	**1.3**	**0.6**	**0.5**	**0.5**	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Dump Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pipe Hauling Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00154	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.4**	**0.4**	**0.4**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**

Note: Totals may not match sum of individual values because of rounding.

Table 11-H
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	0.04847	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Crane, 20-Ton, TR400	0.04591	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.03183	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Welder, Multiquip, BLW-300SS	0.00703	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05137	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Trencher, Cat 140G	0.07432	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.07616	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Scraper, CAT 657G, Tractor Engine	0.10328	0.0	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.05972	0.0	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.05205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Truck, Concrete Pump, International	0.05639	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Construction Equipment Total		**0.0**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.6**	**0.9**	**1.2**	**1.2**	**1.2**	**1.2**	**1.3**	**1.3**	**1.3**
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Off-Site Dump Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Off-Site Pickup Trucks	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Off-Site Pipe Hauling Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00142	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.3	0.0
Off-Site Tractor-Trailer	0.00142	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.2
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.8**	**0.9**	**1.0**	**1.1**	**1.1**	**1.2**	**1.3**	**1.3**	**1.2**	**0.5**

Table 11-H (continued)
Solar Array Construction Maximum Hourly Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Maximum Hourly Emissions (lb/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	0.04847	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	0.04591	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.03183	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.00703	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	0.05137	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	0.07432	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	0.07616	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	0.10328	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	0.05972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	0.05205	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	0.05639	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**1.0**	**1.2**	**1.1**	**0.5**	**0.5**	**0.4**	**0.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Dump Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00003	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pipe Hauling Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00142	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.4**	**0.4**	**0.4**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**

Note: Totals may not match sum of individual values because of rounding.

Table 11-I

Solar Array Construction Maximum Hourly Motor Vehicle Fugitive PM10 Emissions

Vehicle Type	Emission Factor (lb/mile)	Maxum Hourly Emissions (lb/hr) Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-site Vehicles																
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	1.04	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2
On-Site Pickup Truck	1.04	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00090	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Off-Site Cement Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Off-Site Dump Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Off-Site Pickup Trucks	0.00092	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2
Off-Site Pipe Hauling Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00100	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	0.2	0.2	1.3	1.3	1.3	1.9	2.6	3.2	4.5	5.8	7.1	10.9	11.6	9.6	0.3
Off-Site Tractor-Trailer	0.00100	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.1
On-Site Motor Vehicle Total		**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**4.2**	**4.2**	**8.3**	**8.3**	**8.3**	**8.3**	**8.3**	**8.3**	**8.3**
Off-Site Motor Vehicle Total		**0.2**	**0.2**	**1.4**	**1.4**	**1.4**	**2.7**	**3.4**	**4.1**	**5.4**	**6.7**	**7.9**	**11.8**	**12.4**	**10.5**	**5.0**

Table 11-I (continued)

Solar Array Construction Maximum Hourly Motor Vehicle Fugitive PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/mile)	Maximum Hourly Emissions (lb/hr) Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
On-site Vehicles													
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	1.04	4.2	4.2	4.2	4.2	4.2	4.2	4.2	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	1.04	4.2	4.2	4.2	4.2	4.2	4.2	4.2	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00090	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00092	3.9	3.4	3.3	3.1	3.0	2.8	2.3	2.2	1.9	1.9	1.9	1.8
Off-Site Pipe Hauling Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Off-Site Tractor-Trailer	0.00100	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**8.3**	**8.3**	**8.3**	**8.3**	**8.3**	**8.3**	**8.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**4.5**	**4.0**	**3.8**	**3.4**	**3.3**	**3.0**	**2.6**	**2.4**	**2.2**	**2.1**	**2.1**	**2.0**

Note: Totals may not match sum of individual values because of rounding.

Table 11-J
Solar Array Construction Maximum Hourly Motor Vehicle Fugitive PM2.5 Emissions

Vehicle Type	Emission Factor (lb/mile)	Maxum Hourly Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-site Vehicles																
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.22	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9
On-Site Pickup Truck	0.22	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.00016	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Off-Site Cement Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00017	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	0.0	0.0	0.2	0.2	0.2	0.3	0.5	0.6	0.8	1.0	1.3	2.0	2.1	1.7	0.1
Off-Site Tractor-Trailer	0.00019	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
On-Site Motor Vehicle Total		**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.9**	**0.9**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.2**	**0.2**	**0.2**	**0.5**	**0.6**	**0.7**	**1.0**	**1.2**	**1.4**	**2.1**	**2.3**	**1.9**	**0.9**

Table 11-J (continued)
Solar Array Construction Maximum Hourly Motor Vehicle Fugitive PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/mile)	Maximum Hourly Emissions (lb/hr)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
On-site Vehicles													
On-Site Watering Truck	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.22	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.22	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.00016	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.00017	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Motor Vehicle Total		**1.8**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Total		**0.8**	**0.7**	**0.7**	**0.6**	**0.6**	**0.6**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**

Note: Totals may not match sum of individual values because of rounding.

Table 11-K
Solar Array Construction Maximum Hourly Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Hour														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	Cu. Yd.	0	0	1,478	1,478	1,478	0	0	0	0	0	0	0	0	0	0
Storage Pile Wind Erosion[a]	Acre-Hours	0.00	0.00	1.50	1.50	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bulldozing and Grading	Hours	0	4	4	4	4	4	1	1	1	1	1	1	1	1	1

Table 11-K (continued)
Solar Array Construction Maximum Hourly Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Hour											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Excavation	Cu. Yd.	0	0	0	0	0	0	0	0	0	0	0	0
Storage Pile Wind Erosion[a]	Acre-Hours	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bulldozing and Grading	Hours	1	1	1	1	1	1	1	0	0	0	0	0

[a] Based on 30 days per month

Table 11-L
Solar Array Construction Maximum Hourly Fugitive PM10 Emissions

Activity	Emission Factor	Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	9.94E-04	0.0	0.0	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.179	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.617	0.0	2.5	2.5	2.5	2.5	2.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Total		**0.0**	**2.5**	**4.2**	**4.2**	**4.2**	**2.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**

Table 11-L (continued)
Solar Array Construction Maximum Hourly Fugitive PM10 Emissions

Activity	Emission Factor	Emissions (lb/hr)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Excavation	9.94E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.179	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.617	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0
Total		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 11-M
Solar Array Construction Maximum Hourly Fugitive PM2.5 Emissions

Activity	Emission Factor	Emissions (lb/hr)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	2.07E-04	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.037	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.128	0.0	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total		**0.0**	**0.5**	**0.9**	**0.9**	**0.9**	**0.5**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**

Table 11-M (continued)
Solar Array Construction Maximum Hourly Fugitive PM2.5 Emissions

Activity	Emission Factor	Emissions (lb/hr)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Excavation	2.07E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.037	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozing and Grading	0.128	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 12-A
Combined Cycle Facility Construction CO Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	25.0	26.1	27.3	28.5	29.5	30.0	30.4	30.8	31.2	31.7	31.9	31.8	31.4	31.0
Motor Vehicles	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
On-Site Total	**25.1**	**26.3**	**27.5**	**28.6**	**29.7**	**30.1**	**30.6**	**31.0**	**31.4**	**31.9**	**32.0**	**32.0**	**31.6**	**31.2**
Off-Site Motor Vehicles	**17.0**	**17.9**	**18.7**	**19.1**	**19.3**	**19.2**	**18.8**	**18.1**	**17.4**	**16.6**	**15.5**	**14.5**	**13.4**	**12.3**
12-Month Total	**42.1**	**44.2**	**46.1**	**47.7**	**48.9**	**49.4**	**49.4**	**49.2**	**48.8**	**48.4**	**47.6**	**46.5**	**45.0**	**43.5**
Maximum On-Site 12-Month Total (ton/year)	**32.0**													
Maximum 12-Month Total (ton/year)	**49.4**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	3,164.9	3,204.7	3,244.7	3,293.4	4,375.4	4,372.0	4,429.8	4,415.4	4,455.5	4,455.5	4,935.9	5,559.1	5,518.5	5,549.9
Motor Vehicles	20.8	20.8	20.8	20.8	20.8	21.9	21.9	21.9	29.2	30.3	31.4	31.4	31.4	31.4
On-Site Total	**3,185.7**	**3,225.4**	**3,265.5**	**3,314.2**	**4,396.2**	**4,393.9**	**4,451.7**	**4,437.4**	**4,484.7**	**4,485.8**	**4,967.3**	**5,590.5**	**5,549.8**	**5,581.3**
Off-Site Motor Vehicles	**1,550.0**	**1,768.7**	**2,010.3**	**2,217.5**	**2,453.4**	**3,142.2**	**3,276.5**	**3,482.5**	**3,506.6**	**3,524.5**	**3,515.4**	**3,555.2**	**3,383.6**	**3,233.9**
Monthly Total	**4,735.7**	**4,994.2**	**5,275.8**	**5,531.7**	**6,849.6**	**7,536.1**	**7,728.2**	**7,919.8**	**7,991.3**	**8,010.3**	**8,482.6**	**9,145.7**	**8,933.4**	**8,815.2**
Maximum On-Site Monthly Total (lb/month)	**5,590.5**													
Maximum Monthly Total (lb/month)	**9,145.7**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	143.9	145.7	147.5	149.7	198.9	198.7	201.4	200.7	202.5	202.5	224.4	252.7	250.8	252.3
Motor Vehicles	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.3	1.4	1.4	1.4	1.4	1.4
On-Site Total	**144.8**	**146.6**	**148.4**	**150.6**	**199.8**	**199.7**	**202.4**	**201.7**	**203.8**	**203.9**	**225.8**	**254.1**	**252.3**	**253.7**
Off-Site Motor Vehicles	**70.5**	**80.4**	**91.4**	**100.8**	**111.5**	**142.8**	**148.9**	**158.3**	**159.4**	**160.2**	**159.8**	**161.6**	**153.8**	**147.0**
Daily Total	**215.3**	**227.0**	**239.8**	**251.4**	**311.3**	**342.5**	**351.3**	**360.0**	**363.2**	**364.1**	**385.6**	**415.7**	**406.1**	**400.7**
Maximum On-Site Daily Total (lb/day)	**254.1**													
Maximum Off-Site Daily Total (lb/day)	**161.6**													
Maximum Daily Total (lb/day)	**415.7**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	23.3	23.7	24.1	24.5	32.2	32.2	32.7	32.7	33.0	33.0	36.3	41.0	40.6	40.9
Motor Vehicles	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6
On-Site Total	**23.7**	**24.1**	**24.5**	**24.9**	**32.6**	**32.6**	**33.1**	**33.1**	**33.6**	**33.6**	**36.9**	**41.6**	**41.2**	**41.5**
Off-Site Motor Vehicles	**36.3**	**41.3**	**47.3**	**52.0**	**57.7**	**72.9**	**76.2**	**80.9**	**81.5**	**81.6**	**81.1**	**83.1**	**78.7**	**75.3**
Hourly Total	**60.0**	**65.4**	**71.8**	**76.9**	**90.4**	**105.5**	**109.3**	**114.0**	**115.1**	**115.2**	**118.0**	**124.7**	**119.9**	**116.8**
Maximum On-Site Hourly Total (lb/hour)	**41.6**													
Maximum Hourly Total (lb/hour)	**124.7**													

Table 12-A (continued)
Combined Cycle Facility Construction CO Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	30.7	30.1	27.4	24.7	22.1	19.4	16.8	14.2	11.8	9.4	7.0	4.6	2.2
Motor Vehicles	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
On-Site Total	**30.8**	**30.3**	**27.6**	**24.9**	**22.2**	**19.6**	**16.9**	**14.3**	**11.8**	**9.4**	**7.0**	**4.6**	**2.2**
Off-Site Motor Vehicles	**11.3**	**10.5**	**9.2**	**8.0**	**6.9**	**5.9**	**4.9**	**4.0**	**3.2**	**2.5**	**1.9**	**1.2**	**0.6**
12-Month Total	**42.1**	**40.7**	**36.7**	**32.9**	**29.1**	**25.4**	**21.8**	**18.2**	**15.0**	**11.9**	**8.9**	**5.8**	**2.8**
Monthly Emissions (lb/month)													
On-Site													
Equipment	5,541.3	5,359.0	5,359.0	5,260.8	5,284.9	5,220.3	5,289.5	4,845.8	4,805.5	4,805.5	4,773.5	4,773.5	4,368.6
Motor Vehicles	31.4	31.4	31.4	31.4	30.2	30.2	30.2	29.1	29.1	29.1	29.1	29.1	29.1
On-Site Total	**5,572.7**	**5,390.4**	**5,390.4**	**5,292.2**	**5,315.1**	**5,250.5**	**5,319.8**	**4,874.9**	**4,834.6**	**4,834.6**	**4,802.6**	**4,802.6**	**4,397.8**
Off-Site Motor Vehicles	**2,843.6**	**2,624.2**	**2,320.5**	**2,264.0**	**2,020.4**	**1,991.4**	**1,830.2**	**1,511.4**	**1,419.4**	**1,281.2**	**1,262.0**	**1,250.5**	**1,193.0**
Monthly Total	**8,416.3**	**8,014.5**	**7,710.8**	**7,556.2**	**7,335.6**	**7,241.9**	**7,150.0**	**6,386.4**	**6,254.0**	**6,115.9**	**6,064.6**	**6,053.1**	**5,590.7**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	251.9	243.6	243.6	239.1	240.2	237.3	240.4	220.3	218.4	218.4	217.0	217.0	198.6
Motor Vehicles	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3
On-Site Total	**253.3**	**245.0**	**245.0**	**240.6**	**241.6**	**238.7**	**241.8**	**221.6**	**219.8**	**219.8**	**218.3**	**218.3**	**199.9**
Off-Site Motor Vehicles	**129.3**	**119.3**	**105.5**	**102.9**	**91.8**	**90.5**	**83.2**	**68.7**	**64.5**	**58.2**	**57.4**	**56.8**	**54.2**
Daily Total	**382.6**	**364.3**	**350.5**	**343.5**	**333.4**	**329.2**	**325.0**	**290.3**	**284.3**	**278.0**	**275.7**	**275.1**	**254.1**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	40.8	38.9	38.9	38.2	38.5	38.0	38.6	35.3	34.9	34.9	34.6	34.6	30.9
Motor Vehicles	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
On-Site Total	**41.4**	**39.5**	**39.5**	**38.8**	**39.0**	**38.5**	**39.2**	**35.9**	**35.5**	**35.5**	**35.1**	**35.1**	**31.5**
Off-Site Motor Vehicles	**65.9**	**60.4**	**53.4**	**51.6**	**46.8**	**45.8**	**42.1**	**35.3**	**33.2**	**30.1**	**29.5**	**29.2**	**27.9**
Hourly Total	**107.3**	**99.9**	**92.9**	**90.4**	**85.9**	**84.3**	**81.3**	**71.2**	**68.7**	**65.6**	**64.6**	**64.3**	**59.4**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 12-B
Combined Cycle Facility Construction Maximum On-Site CO Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	41.0	252.7	31.9
Motor Vehicles[a]	0.6	1.4	0.2
Maximum On-Site Total	**41.6**	**254.1**	**32.0**

[a] Emissions from source during period with maximum on-site total emissions

Table 12-C
Combined Cycle Facility Construction VOC Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	2.1	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**2.1**	**2.2**	**2.3**	**2.3**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.3**	**2.3**	**2.3**	**2.2**
Off-Site Motor Vehicles	**1.7**	**1.8**	**1.9**	**1.9**	**1.9**	**1.9**	**1.9**	**1.8**	**1.7**	**1.6**	**1.5**	**1.4**	**1.3**	**1.2**
12-Month Total	**3.8**	**4.0**	**4.1**	**4.3**	**4.3**	**4.3**	**4.3**	**4.2**	**4.1**	**4.0**	**3.9**	**3.7**	**3.6**	**3.4**
Maximum On-Site 12-Month Total (ton/year)	**2.4**													
Maximum 12-Month Total (ton/year)	**4.3**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	250.6	265.8	280.2	297.9	349.1	356.1	377.5	371.6	386.0	386.0	393.2	442.6	427.8	438.9
Motor Vehicles	1.9	1.9	1.9	1.9	1.9	2.2	2.2	2.2	2.6	2.7	2.8	2.8	2.8	2.8
On-Site Total	**252.5**	**267.7**	**282.1**	**299.8**	**351.0**	**358.3**	**379.7**	**373.7**	**388.6**	**388.7**	**396.0**	**445.4**	**430.6**	**441.7**
Off-Site Motor Vehicles	**145.4**	**165.5**	**191.1**	**210.1**	**234.3**	**314.0**	**326.3**	**362.3**	**364.6**	**361.8**	**359.7**	**347.1**	**331.2**	**317.5**
Monthly Total	**397.9**	**433.2**	**473.2**	**509.9**	**585.3**	**672.3**	**706.0**	**736.0**	**753.2**	**750.5**	**755.7**	**792.5**	**761.8**	**759.2**
Maximum On-Site Monthly Total (lb/month)	**445.4**													
Maximum Monthly Total (lb/month)	**792.5**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	11.4	12.1	12.7	13.5	15.9	16.2	17.2	16.9	17.5	17.5	17.9	20.1	19.4	19.9
Motor Vehicles	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Total	**11.5**	**12.2**	**12.8**	**13.6**	**16.0**	**16.3**	**17.3**	**17.0**	**17.7**	**17.7**	**18.0**	**20.2**	**19.6**	**20.1**
Off-Site Motor Vehicles	**6.6**	**7.5**	**8.7**	**9.6**	**10.7**	**14.3**	**14.8**	**16.5**	**16.6**	**16.4**	**16.3**	**15.8**	**15.1**	**14.4**
Daily Total	**18.1**	**19.7**	**21.5**	**23.2**	**26.6**	**30.6**	**32.1**	**33.5**	**34.2**	**34.1**	**34.3**	**36.0**	**34.6**	**34.5**
Maximum On-Site Daily Total (lb/day)	**20.2**													
Maximum Off-Site Daily Total (lb/day)	**16.6**													
Maximum Daily Total (lb/day)	**36.0**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	2.1	2.3	2.4	2.5	3.0	3.0	3.2	3.2	3.3	3.3	3.3	3.8	3.6	3.7
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Total	**2.1**	**2.3**	**2.4**	**2.6**	**3.0**	**3.0**	**3.3**	**3.2**	**3.4**	**3.4**	**3.4**	**3.8**	**3.7**	**3.8**
Off-Site Motor Vehicles	**3.4**	**3.9**	**4.6**	**5.0**	**5.6**	**7.3**	**7.6**	**8.3**	**8.3**	**8.1**	**8.0**	**8.0**	**7.6**	**7.3**
Hourly Total	**5.5**	**6.2**	**7.0**	**7.6**	**8.6**	**10.3**	**10.8**	**11.5**	**11.7**	**11.5**	**11.4**	**11.8**	**11.2**	**11.0**
Maximum On-Site Hourly Total (lb/hour)	**3.8**													
Maximum Hourly Total (lb/hour)	**11.8**													

Table 12-C (continued)
Combined Cycle Facility Construction VOC Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	2.2	2.1	1.9	1.7	1.5	1.3	1.2	1.0	0.8	0.6	0.5	0.3	0.1
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**2.2**	**2.1**	**1.9**	**1.7**	**1.5**	**1.3**	**1.2**	**1.0**	**0.8**	**0.6**	**0.5**	**0.3**	**0.1**
Off-Site Motor Vehicles	**1.1**	**1.0**	**0.9**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.3**	**0.2**	**0.2**	**0.1**	**0.1**
12-Month Total	**3.3**	**3.1**	**2.8**	**2.5**	**2.2**	**1.9**	**1.6**	**1.4**	**1.1**	**0.9**	**0.6**	**0.4**	**0.2**
Monthly Emissions (lb/month)													
On-Site													
Equipment	435.6	374.9	374.9	350.4	356.8	335.8	353.0	363.8	352.8	352.8	341.2	341.2	219.7
Motor Vehicles	2.8	2.8	2.8	2.8	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.5
On-Site Total	**438.5**	**377.7**	**377.7**	**353.2**	**359.4**	**338.4**	**355.6**	**366.2**	**355.2**	**355.2**	**343.7**	**343.7**	**222.2**
Off-Site Motor Vehicles	**281.5**	**260.6**	**232.7**	**227.4**	**192.9**	**190.1**	**175.3**	**143.2**	**134.7**	**122.0**	**120.2**	**119.2**	**113.9**
Monthly Total	**719.9**	**638.3**	**610.4**	**580.6**	**552.3**	**528.5**	**530.9**	**509.4**	**489.9**	**477.2**	**463.9**	**462.9**	**336.1**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	19.8	17.0	17.0	15.9	16.2	15.3	16.0	16.5	16.0	16.0	15.5	15.5	10.0
Motor Vehicles	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Total	**19.9**	**17.2**	**17.2**	**16.1**	**16.3**	**15.4**	**16.2**	**16.6**	**16.1**	**16.1**	**15.6**	**15.6**	**10.1**
Off-Site Motor Vehicles	**12.8**	**11.8**	**10.6**	**10.3**	**8.8**	**8.6**	**8.0**	**6.5**	**6.1**	**5.5**	**5.5**	**5.4**	**5.2**
Daily Total	**32.7**	**29.0**	**27.7**	**26.4**	**25.1**	**24.0**	**24.1**	**23.2**	**22.3**	**21.7**	**21.1**	**21.0**	**15.3**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	3.7	3.1	3.1	2.9	3.0	2.8	3.0	3.0	2.9	2.9	2.8	2.8	1.7
Motor Vehicles	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**3.8**	**3.1**	**3.1**	**2.9**	**3.0**	**2.9**	**3.0**	**3.0**	**2.9**	**2.9**	**2.8**	**2.8**	**1.7**
Off-Site Motor Vehicles	**6.4**	**5.9**	**5.2**	**5.0**	**4.4**	**4.3**	**4.0**	**3.4**	**3.2**	**2.9**	**2.8**	**2.8**	**2.7**
Hourly Total	**10.2**	**9.0**	**8.3**	**8.0**	**7.5**	**7.2**	**7.0**	**6.4**	**6.1**	**5.8**	**5.7**	**5.6**	**4.4**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 12-D
Combined Cycle Facility Construction Maximum On-Site VOC Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	3.8	20.1	2.4
Motor Vehicles[a]	0.1	0.1	0.0
Maximum On-Site Total	**3.8**	**20.2**	**2.4**

[a] Emissions from source during period with maximum on-site total emissions

Table 12-E
Combined Cycle Facility Construction NOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	10.7	11.2	11.7	12.1	12.2	12.1	12.0	11.8	11.5	11.3	11.1	10.9	10.5	10.1
Motor Vehicles	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Total	**10.8**	**11.3**	**11.8**	**12.2**	**12.3**	**12.2**	**12.1**	**11.9**	**11.6**	**11.4**	**11.2**	**11.0**	**10.6**	**10.2**
Off-Site Motor Vehicles	**4.5**	**4.7**	**5.0**	**5.2**	**5.4**	**5.5**	**5.4**	**5.1**	**4.6**	**4.2**	**3.7**	**3.2**	**2.9**	**2.7**
12-Month Total	**15.3**	**16.1**	**16.8**	**17.4**	**17.6**	**17.7**	**17.5**	**17.0**	**16.3**	**15.5**	**14.8**	**14.2**	**13.5**	**12.9**
Maximum On-Site 12-Month Total (ton/year)	**12.3**													
Maximum 12-Month Total (ton/year)	**17.7**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	1,165.1	1,318.0	1,462.2	1,620.7	1,765.6	1,812.9	1,971.3	1,907.0	2,051.2	2,051.2	1,991.9	2,308.5	2,178.9	2,308.7
Motor Vehicles	13.3	13.3	13.3	13.3	13.3	17.3	17.3	17.3	18.4	18.6	18.7	18.7	18.7	18.7
On-Site Total	**1,178.4**	**1,331.2**	**1,475.4**	**1,633.9**	**1,778.9**	**1,830.2**	**1,988.6**	**1,924.3**	**2,069.6**	**2,069.8**	**2,010.7**	**2,327.3**	**2,197.6**	**2,327.5**
Off-Site Motor Vehicles	**200.5**	**219.1**	**319.0**	**336.6**	**416.2**	**857.5**	**868.9**	**1,285.1**	**1,291.1**	**1,186.7**	**1,154.1**	**776.1**	**760.3**	**747.6**
Monthly Total	**1,378.9**	**1,550.3**	**1,794.4**	**1,970.5**	**2,195.0**	**2,687.7**	**2,857.4**	**3,209.4**	**3,360.8**	**3,256.4**	**3,164.8**	**3,103.4**	**2,957.9**	**3,075.1**
Maximum On-Site Monthly Total (lb/month)	**2,327.5**													
Maximum Monthly Total (lb/month)	**3,360.8**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	53.0	59.9	66.5	73.7	80.3	82.4	89.6	86.7	93.2	93.2	90.5	104.9	99.0	104.9
Motor Vehicles	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9
On-Site Total	**53.6**	**60.5**	**67.1**	**74.3**	**80.9**	**83.2**	**90.4**	**87.5**	**94.1**	**94.1**	**91.4**	**105.8**	**99.9**	**105.8**
Off-Site Motor Vehicles	**9.1**	**10.0**	**14.5**	**15.3**	**18.9**	**39.0**	**39.5**	**58.4**	**58.7**	**53.9**	**52.5**	**35.3**	**34.6**	**34.0**
Daily Total	**62.7**	**70.5**	**81.6**	**89.6**	**99.8**	**122.2**	**129.9**	**145.9**	**152.8**	**148.0**	**143.9**	**141.1**	**134.4**	**139.8**
Maximum On-Site Daily Total (lb/day)	**105.8**													
Maximum Off-Site Daily Total (lb/day)	**58.7**													
Maximum Daily Total (lb/day)	**152.8**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	10.6	12.3	13.6	15.1	16.6	17.0	18.6	18.1	19.4	19.4	18.9	22.1	20.7	21.9
Motor Vehicles	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
On-Site Total	**10.9**	**12.6**	**14.0**	**15.4**	**16.9**	**17.3**	**19.0**	**18.5**	**19.8**	**19.8**	**19.3**	**22.5**	**21.1**	**22.3**
Off-Site Motor Vehicles	**4.8**	**5.2**	**9.3**	**9.7**	**12.9**	**19.3**	**19.6**	**25.9**	**26.1**	**21.3**	**19.8**	**14.9**	**14.5**	**14.2**
Hourly Total	**15.7**	**17.8**	**23.3**	**25.1**	**29.8**	**36.7**	**38.6**	**44.3**	**45.9**	**41.1**	**39.0**	**37.4**	**35.5**	**36.5**
Maximum On-Site Hourly Total (lb/hour)	**22.5**													
Maximum Hourly Total (lb/hour)	**45.9**													

Table 12-E (continued)
Combined Cycle Facility Construction NOx Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	9.7	8.9	8.1	7.2	6.5	5.7	5.0	4.2	3.4	2.6	1.8	1.1	0.4
Motor Vehicles	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**9.8**	**9.0**	**8.2**	**7.3**	**6.6**	**5.8**	**5.1**	**4.3**	**3.4**	**2.6**	**1.8**	**1.1**	**0.4**
Off-Site Motor Vehicles	**2.4**	**2.1**	**1.8**	**1.5**	**1.1**	**1.0**	**0.8**	**0.6**	**0.5**	**0.4**	**0.3**	**0.2**	**0.1**
12-Month Total	**12.2**	**11.2**	**10.0**	**8.8**	**7.7**	**6.7**	**5.9**	**4.9**	**4.0**	**3.1**	**2.2**	**1.3**	**0.5**
Monthly Emissions (lb/month)													
On-Site													
Equipment	2,294.4	1,688.4	1,688.4	1,497.9	1,542.5	1,417.2	1,557.1	1,652.5	1,585.6	1,585.6	1,470.2	1,470.2	709.4
Motor Vehicles	18.7	18.7	18.7	18.7	14.7	14.7	14.7	14.5	14.5	14.5	14.5	14.5	14.5
On-Site Total	**2,313.1**	**1,707.1**	**1,707.1**	**1,516.7**	**1,557.1**	**1,431.9**	**1,571.7**	**1,667.0**	**1,600.1**	**1,600.1**	**1,484.7**	**1,484.7**	**723.9**
Off-Site Motor Vehicles	**713.2**	**678.7**	**652.7**	**646.7**	**340.0**	**336.5**	**322.8**	**228.3**	**220.4**	**208.7**	**207.1**	**206.1**	**201.2**
Monthly Total	**3,026.3**	**2,385.8**	**2,359.8**	**2,163.3**	**1,897.1**	**1,768.4**	**1,894.6**	**1,895.2**	**1,820.5**	**1,808.8**	**1,691.8**	**1,690.9**	**925.2**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	104.3	76.7	76.7	68.1	70.1	64.4	70.8	75.1	72.1	72.1	66.8	66.8	32.2
Motor Vehicles	0.9	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
On-Site Total	**105.1**	**77.6**	**77.6**	**68.9**	**70.8**	**65.1**	**71.4**	**75.8**	**72.7**	**72.7**	**67.5**	**67.5**	**32.9**
Off-Site Motor Vehicles	**32.4**	**30.9**	**29.7**	**29.4**	**15.5**	**15.3**	**14.7**	**10.4**	**10.0**	**9.5**	**9.4**	**9.4**	**9.1**
Daily Total	**137.6**	**108.4**	**107.3**	**98.3**	**86.2**	**80.4**	**86.1**	**86.1**	**82.8**	**82.2**	**76.9**	**76.9**	**42.1**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	21.8	15.5	15.5	14.1	14.6	13.6	14.9	15.0	14.4	14.4	13.1	13.1	6.2
Motor Vehicles	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
On-Site Total	**22.2**	**15.9**	**15.9**	**14.5**	**14.9**	**14.0**	**15.2**	**15.3**	**14.7**	**14.7**	**13.4**	**13.4**	**6.5**
Off-Site Motor Vehicles	**13.3**	**12.1**	**11.5**	**11.3**	**7.1**	**7.0**	**6.7**	**6.1**	**5.9**	**5.7**	**5.6**	**5.6**	**5.5**
Hourly Total	**35.5**	**28.1**	**27.5**	**25.8**	**22.0**	**20.9**	**21.9**	**21.4**	**20.6**	**20.4**	**19.0**	**19.0**	**12.0**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 12-F
Combined Cycle Facility Construction Maximum On-Site NOx Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	22.1	104.9	12.2
Motor Vehicles[a]	0.4	0.9	0.1
Maximum On-Site Total	**22.5**	**105.8**	**12.3**

[a] Emissions from source during period with maximum on-site total emissions

Table 12-G
Combined Cycle Facility Construction SOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
12-Month Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Maximum On-Site 12-Month Total (ton/year)	**0.0**													
Maximum 12-Month Total (ton/year)	**0.0**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	1.2	1.4	1.5	1.7	1.8	1.9	2.1	2.0	2.1	2.1	2.1	2.4	2.2	2.4
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**1.2**	**1.4**	**1.5**	**1.7**	**1.9**	**1.9**	**2.1**	**2.0**	**2.1**	**2.1**	**2.1**	**2.4**	**2.3**	**2.4**
Off-Site Motor Vehicles	**0.2**	**0.2**	**0.4**	**0.4**	**0.5**	**1.3**	**1.3**	**2.2**	**2.2**	**2.0**	**1.9**	**1.2**	**1.1**	**1.1**
Monthly Total	**1.4**	**1.6**	**1.9**	**2.0**	**2.3**	**3.2**	**3.4**	**4.2**	**4.3**	**4.1**	**4.0**	**3.6**	**3.4**	**3.5**
Maximum On-Site Monthly Total (lb/month)	**2.4**													
Maximum Monthly Total (lb/month)	**4.3**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Daily Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Maximum On-Site Daily Total (lb/day)	**0.1**													
Maximum Off-Site Daily Total (lb/day)	**0.1**													
Maximum Daily Total (lb/day)	**0.2**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Hourly Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
Maximum On-Site Hourly Total (lb/hour)	**0.0**													
Maximum Hourly Total (lb/hour)	**0.1**													

Table 12-G (continued)
Combined Cycle Facility Construction SOx Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
12-Month Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Emissions (lb/month)													
On-Site													
Equipment	2.4	1.8	1.8	1.6	1.6	1.5	1.6	1.7	1.6	1.6	1.5	1.5	0.8
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**2.4**	**1.8**	**1.8**	**1.6**	**1.6**	**1.5**	**1.7**	**1.7**	**1.6**	**1.6**	**1.5**	**1.5**	**0.9**
Off-Site Motor Vehicles	**1.1**	**1.0**	**1.0**	**1.0**	**0.4**	**0.4**	**0.4**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Monthly Total	**3.5**	**2.8**	**2.8**	**2.6**	**2.0**	**1.9**	**2.0**	**1.9**	**1.9**	**1.9**	**1.8**	**1.8**	**1.1**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Daily Total	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Hourly Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 12-H
Combined Cycle Facility Construction Maximum On-Site SOx Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	0.0	0.1	0.0
Motor Vehicles[a]	0.0	0.0	0.0
Maximum On-Site Total	**0.0**	**0.1**	**0.0**

[a] Emissions from source during period with maximum on-site total emissions

Table 12-I
Combined Cycle Facility Construction PM10 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	6.0	6.0	6.0	6.2	6.5	6.7	6.8	6.9	7.0	7.0	6.9	6.7	6.6	6.4
On-Site Total	**6.9**	**6.9**	**6.9**	**7.1**	**7.4**	**7.6**	**7.7**	**7.8**	**7.9**	**7.9**	**7.8**	**7.6**	**7.5**	**7.3**
Off-Site Motor Vehicle Exhaust and Fugitive	**2.0**	**2.1**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.1**	**2.0**	**1.9**	**1.8**	**1.6**	**1.5**	**1.4**
12-Month Total	**8.8**	**9.0**	**9.0**	**9.4**	**9.6**	**9.9**	**9.9**	**9.9**	**9.9**	**9.8**	**9.6**	**9.3**	**9.0**	**8.7**
Maximum On-Site 12-Month Total (ton/year)	**7.9**													
Maximum 12-Month Total (ton/year)	**9.9**													
Monthly Emissions (lb/month)														
	1386.8	1392.2	887.4	893.9	911.3	1027.1	1034.5	1032.9	1153.1	1267.7	1382.3	1400.2	1394.8	1399.2
On-Site														
Equipment	106.5	111.9	117.4	123.9	141.4	142.3	149.7	148.2	153.7	153.7	153.5	171.4	166.0	170.5
Motor Vehicle Exhaust	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Fugitive	1,279.8	1,279.8	769.5	769.5	769.5	884.1	884.1	884.1	998.8	1,113.5	1,228.1	1,228.1	1,228.1	1,228.1
On-Site Total	**1,386.8**	**1,392.2**	**887.4**	**893.9**	**911.3**	**1,027.1**	**1,034.5**	**1,032.9**	**1,153.1**	**1,267.7**	**1,382.3**	**1,400.2**	**1,394.8**	**1,399.2**
Off-Site Motor Vehicle Exhaust and Fugitive	**170.8**	**194.6**	**224.0**	**246.6**	**274.5**	**364.0**	**378.6**	**416.1**	**418.9**	**416.3**	**414.1**	**403.5**	**385.2**	**368.9**
Monthly Total	**1,557.6**	**1,586.8**	**1,111.4**	**1,140.4**	**1,185.8**	**1,391.0**	**1,413.1**	**1,449.0**	**1,572.0**	**1,684.1**	**1,796.4**	**1,803.7**	**1,779.9**	**1,768.1**
Maximum On-Site Monthly Total (lb/month)	**1,400.2**													
Maximum Monthly Total (lb/month)	**1,803.7**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	4.8	5.1	5.3	5.6	6.4	6.5	6.8	6.7	7.0	7.0	7.0	7.8	7.5	7.7
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	58.2	58.2	35.0	35.0	35.0	40.2	40.2	40.2	45.4	50.6	55.8	55.8	55.8	55.8
On-Site Total	**63.0**	**63.3**	**40.3**	**40.6**	**41.4**	**46.7**	**47.0**	**47.0**	**52.4**	**57.6**	**62.8**	**63.6**	**63.4**	**63.6**
Off-Site Motor Vehicle Exhaust and Fugitive	**7.8**	**8.8**	**10.2**	**11.2**	**12.5**	**16.5**	**17.2**	**18.9**	**19.0**	**18.9**	**18.8**	**18.3**	**17.5**	**16.8**
Daily Total	**70.8**	**72.1**	**50.5**	**51.8**	**53.9**	**63.2**	**64.2**	**65.9**	**71.5**	**76.5**	**81.7**	**82.0**	**80.9**	**80.4**
Maximum On-Site Daily Total (lb/day)	**63.6**													
Maximum Off-Site Daily Total (lb/day)	**19.0**													
Maximum Daily Total (lb/day)	**82.0**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.5	1.4	1.5
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	14.9	14.9	13.1	13.1	13.1	15.2	15.2	15.2	17.3	19.4	21.5	21.5	21.5	21.5
On-Site Total	**15.8**	**15.8**	**14.2**	**14.2**	**14.4**	**16.4**	**16.5**	**16.5**	**18.6**	**20.7**	**22.8**	**23.0**	**22.9**	**22.9**
Off-Site Motor Vehicle Exhaust and Fugitive	**4.0**	**4.5**	**5.3**	**5.8**	**6.6**	**8.4**	**8.8**	**9.5**	**9.6**	**9.4**	**9.3**	**9.3**	**8.8**	**8.4**
Hourly Total	**19.8**	**20.4**	**19.5**	**20.1**	**20.9**	**24.9**	**25.3**	**26.0**	**28.2**	**30.1**	**32.1**	**32.2**	**31.7**	**31.4**
Maximum On-Site Hourly Total (lb/hour)	**23.0**													
Maximum Hourly Total (lb/hour)	**32.2**													

Table 12-I (continued)
Combined Cycle Facility Construction PM10 Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.0
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	6.3	6.1	5.5	4.9	4.3	3.8	3.3	2.8	2.3	1.8	1.4	0.9	0.5
On-Site Total	**7.1**	**6.9**	**6.2**	**5.5**	**4.9**	**4.3**	**3.7**	**3.1**	**2.6**	**2.1**	**1.6**	**1.0**	**0.5**
Off-Site Motor Vehicle Exhaust and Fugitive	**1.3**	**1.2**	**1.0**	**0.9**	**0.8**	**0.7**	**0.5**	**0.4**	**0.4**	**0.3**	**0.2**	**0.1**	**0.1**
12-Month Total	**8.4**	**8.1**	**7.3**	**6.4**	**5.7**	**5.0**	**4.3**	**3.6**	**3.0**	**2.4**	**1.8**	**1.2**	**0.6**
Monthly Emissions (lb/month)													
On-Site													
Equipment	169.5	146.8	146.8	135.8	140.0	129.4	136.9	148.1	141.9	141.9	137.6	137.6	75.2
Motor Vehicle Exhaust	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Fugitive	1,228.1	1,228.1	1,228.1	1,146.6	1,031.9	1,031.9	1,031.9	917.3	917.3	917.3	917.3	917.3	917.3
On-Site Total	**1,398.2**	**1,375.5**	**1,375.5**	**1,283.1**	**1,172.4**	**1,161.8**	**1,169.3**	**1,065.8**	**1,059.7**	**1,059.7**	**1,055.3**	**1,055.3**	**992.9**
Off-Site Motor Vehicle Exhaust and Fugitive	**326.8**	**302.3**	**269.3**	**263.5**	**225.8**	**222.9**	**205.4**	**168.1**	**158.1**	**143.0**	**141.0**	**139.7**	**133.4**
Monthly Total	**1,725.0**	**1,677.8**	**1,644.8**	**1,546.6**	**1,398.3**	**1,384.7**	**1,374.7**	**1,233.9**	**1,217.8**	**1,202.7**	**1,196.2**	**1,195.0**	**1,126.4**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	7.7	6.7	6.7	6.2	6.4	5.9	6.2	6.7	6.5	6.5	6.3	6.3	3.4
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	55.8	55.8	55.8	52.1	46.9	46.9	46.9	41.7	41.7	41.7	41.7	41.7	41.7
On-Site Total	**63.6**	**62.5**	**62.5**	**58.3**	**53.3**	**52.8**	**53.2**	**48.4**	**48.2**	**48.2**	**48.0**	**48.0**	**45.1**
Off-Site Motor Vehicle Exhaust and Fugitive	**14.9**	**13.7**	**12.2**	**12.0**	**10.3**	**10.1**	**9.3**	**7.6**	**7.2**	**6.5**	**6.4**	**6.4**	**6.1**
Daily Total	**78.4**	**76.3**	**74.8**	**70.3**	**63.6**	**62.9**	**62.5**	**56.1**	**55.4**	**54.7**	**54.4**	**54.3**	**51.2**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	1.5	1.2	1.2	1.1	1.2	1.1	1.2	1.2	1.2	1.2	1.1	1.1	0.6
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	21.5	21.5	21.5	20.8	18.8	18.8	18.8	16.7	16.7	16.7	16.7	16.7	16.7
On-Site Total	**22.9**	**22.7**	**22.7**	**22.0**	**20.0**	**19.9**	**20.0**	**17.9**	**17.9**	**17.9**	**17.8**	**17.8**	**17.3**
Off-Site Motor Vehicle Exhaust and Fugitive	**7.4**	**6.8**	**6.0**	**5.9**	**5.2**	**5.1**	**4.7**	**4.0**	**3.7**	**3.4**	**3.3**	**3.3**	**3.1**
Hourly Total	**30.4**	**29.5**	**28.7**	**27.9**	**25.2**	**25.0**	**24.6**	**21.9**	**21.6**	**21.3**	**21.1**	**21.1**	**20.4**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 12-J
Combined Cycle Facility Construction Maximum On-Site PM10 Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	1.5	7.8	0.9
Motor Vehicle Exhaust[a]	0.0	0.0	0.0
Fugitive[a]	21.5	55.8	7.0
Maximum On-Site Total	**23.0**	**63.6**	**7.9**

[a] Emissions from source during period with maximum on-site total emissions

Table 12-K
Combined Cycle Facility Construction PM2.5 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.4	1.4	1.4
On-Site Total	**2.0**	**2.0**	**2.1**	**2.1**	**2.2**	**2.2**	**2.3**	**2.3**	**2.3**	**2.3**	**2.2**	**2.2**	**2.2**	**2.1**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**0.3**
12-Month Total	**2.5**	**2.6**	**2.6**	**2.7**	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**	**2.7**	**2.7**	**2.6**	**2.5**	**2.5**
Maximum On-Site 12-Month Total (ton/year)	**2.3**													
Maximum 12-Month Total (ton/year)	**2.8**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	93.1	98.0	103.1	109.1	123.1	124.0	130.8	129.4	134.5	134.5	133.4	148.8	143.8	148.0
Motor Vehicle Exhaust	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Fugitive	269.0	269.0	162.8	162.8	162.8	187.1	187.1	187.1	211.4	235.7	260.0	260.0	260.0	260.0
On-Site Total	**362.4**	**367.4**	**266.3**	**272.3**	**286.4**	**311.7**	**318.5**	**317.1**	**346.5**	**370.8**	**394.0**	**409.4**	**404.5**	**408.6**
Off-Site Motor Vehicle Exhaust and Fugitive	**37.4**	**42.3**	**50.7**	**55.3**	**62.9**	**92.9**	**95.8**	**115.5**	**116.2**	**112.5**	**111.1**	**97.4**	**93.6**	**90.3**
Monthly Total	**399.9**	**409.7**	**317.0**	**327.6**	**349.2**	**404.6**	**414.4**	**432.6**	**462.7**	**483.2**	**505.0**	**506.8**	**498.1**	**498.9**
Maximum On-Site Monthly Total (lb/month)	**409.4**													
Maximum Monthly Total (lb/month)	**506.8**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	4.2	4.5	4.7	5.0	5.6	5.6	5.9	5.9	6.1	6.1	6.1	6.8	6.5	6.7
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	12.2	12.2	7.4	7.4	7.4	8.5	8.5	8.5	9.6	10.7	11.8	11.8	11.8	11.8
On-Site Total	**16.5**	**16.7**	**12.1**	**12.4**	**13.0**	**14.2**	**14.5**	**14.4**	**15.7**	**16.9**	**17.9**	**18.6**	**18.4**	**18.6**
Off-Site Motor Vehicle Exhaust and Fugitive	**1.7**	**1.9**	**2.3**	**2.5**	**2.9**	**4.2**	**4.4**	**5.3**	**5.3**	**5.1**	**5.0**	**4.4**	**4.3**	**4.1**
Daily Total	**18.2**	**18.6**	**14.4**	**14.9**	**15.9**	**18.4**	**18.8**	**19.7**	**21.0**	**22.0**	**23.0**	**23.0**	**22.6**	**22.7**
Maximum On-Site Daily Total (lb/day)	**18.6**													
Maximum Off-Site Daily Total (lb/day)	**5.3**													
Maximum Daily Total (lb/day)	**23.0**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	0.8	0.2	0.4	0.4	0.5	0.8	0.8	1.0	1.0	0.8	0.8	0.6	0.6	0.6
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	3.1	3.1	2.8	2.8	2.8	3.2	3.2	3.2	3.7	4.1	4.5	4.5	4.5	4.5
On-Site Total	**4.0**	**3.4**	**3.2**	**3.2**	**3.3**	**4.0**	**4.0**	**4.3**	**4.7**	**5.0**	**5.3**	**5.2**	**5.1**	**5.1**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.9**	**1.0**	**1.3**	**1.4**	**1.6**	**2.1**	**2.2**	**2.5**	**2.5**	**2.4**	**2.3**	**2.1**	**2.0**	**2.0**
Hourly Total	**4.8**	**4.4**	**4.4**	**4.6**	**4.9**	**6.1**	**6.2**	**6.8**	**7.3**	**7.3**	**7.6**	**7.3**	**7.2**	**7.1**
Maximum On-Site Hourly Total (lb/hour)	**5.3**													
Maximum Hourly Total (lb/hour)	**7.6**													

Table 12-K (continued)
Combined Cycle Facility Construction PM2.5 Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.0
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	1.3	1.3	1.2	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
On-Site Total	**2.1**	**2.0**	**1.8**	**1.6**	**1.4**	**1.3**	**1.1**	**0.9**	**0.8**	**0.6**	**0.4**	**0.3**	**0.1**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
12-Month Total	**2.4**	**2.3**	**2.0**	**1.8**	**1.6**	**1.4**	**1.2**	**1.0**	**0.8**	**0.7**	**0.5**	**0.3**	**0.1**
Monthly Emissions (lb/month)													
On-Site													
Equipment	147.0	126.1	126.1	116.1	119.9	110.1	117.1	128.3	122.7	122.7	118.6	118.6	61.3
Motor Vehicle Exhaust	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Fugitive	260.0	260.0	260.0	243.1	218.8	218.8	218.8	194.5	194.5	194.5	194.5	194.5	194.5
On-Site Total	**407.7**	**386.8**	**386.8**	**359.7**	**339.1**	**329.3**	**336.3**	**323.2**	**317.6**	**317.6**	**313.5**	**313.5**	**256.1**
Off-Site Motor Vehicle Exhaust and Fugitive	**81.7**	**76.2**	**69.4**	**68.2**	**51.7**	**51.1**	**47.5**	**37.8**	**35.8**	**32.7**	**32.3**	**32.0**	**30.7**
Monthly Total	**489.3**	**462.9**	**456.2**	**428.0**	**390.9**	**380.4**	**383.8**	**361.1**	**353.4**	**350.3**	**345.8**	**345.6**	**286.9**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	6.7	5.7	5.7	5.3	5.5	5.0	5.3	5.8	5.6	5.6	5.4	5.4	2.8
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	11.8	11.8	11.8	11.0	9.9	9.9	9.9	8.8	8.8	8.8	8.8	8.8	8.8
On-Site Total	**18.5**	**17.6**	**17.6**	**16.4**	**15.4**	**15.0**	**15.3**	**14.7**	**14.4**	**14.4**	**14.3**	**14.3**	**11.6**
Off-Site Motor Vehicle Exhaust and Fugitive	**3.7**	**3.5**	**3.2**	**3.1**	**2.4**	**2.3**	**2.2**	**1.7**	**1.6**	**1.5**	**1.5**	**1.5**	**1.4**
Daily Total	**22.2**	**21.0**	**20.7**	**19.5**	**17.8**	**17.3**	**17.4**	**16.4**	**16.1**	**15.9**	**15.7**	**15.7**	**13.0**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	4.5	4.5	4.5	4.4	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5
On-Site Total	**5.1**	**5.0**	**5.0**	**4.9**	**4.3**	**4.3**	**4.2**	**3.8**	**3.8**	**3.8**	**3.8**	**3.8**	**3.8**
Off-Site Motor Vehicle Exhaust and Fugitive	**1.8**	**1.6**	**1.5**	**1.4**	**1.2**	**1.1**	**1.1**	**0.9**	**0.9**	**0.8**	**0.8**	**0.8**	**0.7**
Hourly Total	**6.8**	**6.6**	**6.5**	**6.3**	**5.4**	**5.4**	**5.3**	**4.7**	**4.6**	**4.6**	**4.5**	**4.5**	**4.5**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 12-L
Combined Cycle Facility Construction Maximum On-Site PM2.5 Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	0.8	6.8	0.8
Motor Vehicle Exhaust[a]	0.0	0.0	0.0
Fugitive[a]	4.5	11.8	1.5
Maximum On-Site Total	**5.3**	**18.6**	**2.3**

[a] Emissions from source during period with maximum on-site total emissions

Table 13-A
Solar Array Construction CO Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	20.6	24.2	27.2	30.2	32.3	34.6	36.8	36.7	35.8	34.7	32.8	29.3	25.7	22.2
Motor Vehicles	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Total	**20.7**	**24.3**	**27.3**	**30.3**	**32.5**	**34.7**	**36.9**	**36.8**	**35.9**	**34.8**	**32.9**	**29.4**	**25.8**	**22.2**
Off-Site Motor Vehicles	**10.1**	**12.5**	**14.6**	**15.9**	**16.5**	**16.9**	**16.9**	**16.4**	**15.8**	**15.0**	**14.0**	**12.3**	**9.9**	**7.5**
12-Month Total	**30.8**	**36.8**	**41.9**	**46.1**	**48.9**	**51.6**	**53.8**	**53.3**	**51.7**	**49.8**	**46.9**	**41.7**	**35.8**	**29.7**
Maximum On-Site 12-Month Total (ton/year)	**36.9**													
Maximum 12-Month Total (ton/year)	**53.8**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	0.0	1,117.9	1,117.9	1,117.9	1,117.9	1,150.6	3,515.5	5,262.2	5,566.4	7,063.9	7,081.1	7,081.1	7,129.4	7,129.4
Motor Vehicles	0.8	17.2	17.2	17.2	17.2	17.2	14.2	14.2	22.2	22.2	22.2	22.2	20.2	20.2
On-Site Total	**0.8**	**1,135.2**	**1,135.2**	**1,135.2**	**1,135.2**	**1,167.9**	**3,529.7**	**5,276.4**	**5,588.7**	**7,086.1**	**7,103.3**	**7,103.3**	**7,149.6**	**7,149.6**
Off-Site Motor Vehicles	**57.6**	**57.6**	**479.6**	**479.6**	**479.6**	**1,482.9**	**1,730.3**	**1,969.7**	**2,434.8**	**2,895.2**	**3,355.7**	**4,737.1**	**4,967.4**	**4,276.7**
Monthly Total	**58.3**	**1,192.7**	**1,614.8**	**1,614.8**	**1,614.8**	**2,650.8**	**5,260.1**	**7,246.1**	**8,023.4**	**9,981.4**	**10,459.0**	**11,840.4**	**12,117.0**	**11,426.3**
Maximum On-Site Monthly Total (lb/month)	**7,149.6**													
Maximum Monthly Total (lb/month)	**12,117.0**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	0.0	50.8	50.8	50.8	50.8	52.3	159.8	239.2	253.0	321.1	321.9	321.9	324.1	324.1
Motor Vehicles	0.0	0.8	0.8	0.8	0.8	0.8	0.6	0.6	1.0	1.0	1.0	1.0	0.9	0.9
On-Site Total	**0.0**	**51.6**	**51.6**	**51.6**	**51.6**	**53.1**	**160.4**	**239.8**	**254.0**	**322.1**	**322.9**	**322.9**	**325.0**	**325.0**
Off-Site Motor Vehicles	**2.6**	**2.6**	**21.8**	**21.8**	**21.8**	**67.4**	**78.7**	**89.5**	**110.7**	**131.6**	**152.5**	**215.3**	**225.8**	**194.4**
Daily Total	**2.7**	**54.2**	**73.4**	**73.4**	**73.4**	**120.5**	**239.1**	**329.4**	**364.7**	**453.7**	**475.4**	**538.2**	**550.8**	**519.4**
Maximum On-Site Daily Total (lb/day)	**325.0**													
Maximum Off-Site Daily Total (lb/day)	**225.8**													
Maximum Daily Total (lb/day)	**550.8**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	0.0	6.4	6.4	6.4	6.4	6.7	24.9	37.4	39.9	50.4	50.5	50.5	50.9	50.9
Motor Vehicles	0.0	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
On-Site Total	**0.0**	**6.7**	**6.7**	**6.7**	**6.7**	**7.0**	**25.2**	**37.7**	**40.4**	**50.8**	**50.9**	**50.9**	**51.2**	**51.2**
Off-Site Motor Vehicles	**1.5**	**1.5**	**13.1**	**13.1**	**13.1**	**26.1**	**33.0**	**39.6**	**52.0**	**64.2**	**76.4**	**113.0**	**119.1**	**100.8**
Hourly Total	**1.5**	**8.2**	**19.8**	**19.8**	**19.8**	**33.2**	**58.2**	**77.2**	**92.3**	**115.0**	**127.3**	**163.9**	**170.4**	**152.1**
Maximum On-Site Hourly Total (lb/hour)	**51.2**													
Maximum Hourly Total (lb/hour)	**170.4**													

Table 13-A (continued)
Solar Array Construction CO Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	18.6	15.0	12.3	9.5	6.7	5.0	3.3	1.7	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**18.7**	**15.1**	**12.3**	**9.5**	**6.8**	**5.1**	**3.4**	**1.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**5.3**	**3.9**	**3.0**	**2.3**	**1.6**	**1.2**	**0.8**	**0.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
12-Month Total	**24.0**	**19.0**	**15.3**	**11.8**	**8.4**	**6.3**	**4.2**	**2.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Emissions (lb/month)													
On-Site													
Equipment	7,129.4	5,469.3	5,582.0	5,517.4	3,420.0	3,371.9	3,354.7	3,337.5	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	20.2	20.2	20.2	20.2	18.1	18.1	18.1	18.1	0.0	0.0	0.0	0.0	0.0
On-Site Total	**7,149.6**	**5,489.5**	**5,602.1**	**5,537.6**	**3,438.1**	**3,390.0**	**3,372.8**	**3,355.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**2,895.2**	**1,744.1**	**1,398.7**	**1,398.7**	**793.4**	**793.4**	**793.4**	**793.4**	**7.7**	**7.7**	**0.0**	**0.0**	**0.0**
Monthly Total	**10,044.8**	**7,233.6**	**7,000.9**	**6,936.3**	**4,231.4**	**4,183.4**	**4,166.2**	**4,149.0**	**7.7**	**7.7**	**0.0**	**0.0**	**0.0**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	324.1	248.6	253.7	250.8	155.5	153.3	152.5	151.7	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0
On-Site Total	**325.0**	**249.5**	**254.6**	**251.7**	**156.3**	**154.1**	**153.3**	**152.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**131.6**	**79.3**	**63.6**	**63.6**	**36.1**	**36.1**	**36.1**	**36.1**	**0.3**	**0.3**	**0.0**	**0.0**	**0.0**
Daily Total	**456.6**	**328.8**	**318.2**	**315.3**	**192.3**	**190.2**	**189.4**	**188.6**	**0.3**	**0.3**	**0.0**	**0.0**	**0.0**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	50.9	39.0	39.8	39.3	24.3	24.0	23.8	23.7	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
On-Site Total	**51.2**	**39.3**	**40.2**	**39.7**	**24.7**	**24.3**	**24.2**	**24.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**48.2**	**43.4**	**38.9**	**36.6**	**33.1**	**31.5**	**29.0**	**24.6**	**23.2**	**21.1**	**20.3**	**20.1**	**19.2**
Hourly Total	**99.5**	**82.7**	**79.0**	**76.3**	**57.7**	**55.8**	**53.2**	**48.6**	**23.2**	**21.1**	**20.3**	**20.1**	**19.2**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 13-B
Solar Array Construction Maximum On-Site CO Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	50.9	324.1	36.8
Motor Vehicles[a]	0.4	0.9	0.1
Maximum On-Site Total	**51.2**	**325.0**	**36.9**

[a] Emissions from source during period with maximum on-site total emissions

Table 13-C
Solar Array Construction VOC Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	2.1	2.3	2.4	2.5	2.6	2.6	2.7	2.7	2.6	2.4	2.3	2.0	1.8	1.5
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**2.1**	**2.4**	**2.4**	**2.5**	**2.6**	**2.6**	**2.7**	**2.7**	**2.6**	**2.4**	**2.3**	**2.0**	**1.8**	**1.5**
Off-Site Motor Vehicles	**1.2**	**1.5**	**1.8**	**1.9**	**2.0**	**2.1**	**2.1**	**2.0**	**2.0**	**1.9**	**1.8**	**1.6**	**1.4**	**1.1**
12-Month Total	**3.3**	**3.9**	**4.2**	**4.4**	**4.6**	**4.7**	**4.8**	**4.7**	**4.6**	**4.4**	**4.1**	**3.7**	**3.1**	**2.6**
Maximum On-Site 12-Month Total (ton/year)	**2.7**													
Maximum 12-Month Total (ton/year)	**4.8**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	0.0	328.8	328.8	328.8	328.8	338.6	239.3	359.0	451.4	485.0	491.5	491.5	504.7	504.7
Motor Vehicles	0.1	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.5	2.5	2.5	2.5	2.0	2.0
On-Site Total	**0.1**	**332.8**	**332.8**	**332.8**	**332.8**	**342.6**	**241.3**	**361.0**	**453.9**	**487.5**	**494.0**	**494.0**	**506.7**	**506.7**
Off-Site Motor Vehicles	**5.3**	**5.3**	**45.8**	**45.8**	**45.8**	**222.1**	**247.3**	**270.7**	**314.1**	**356.4**	**398.7**	**525.6**	**546.8**	**483.3**
Monthly Total	**5.4**	**338.1**	**378.6**	**378.6**	**378.6**	**564.7**	**488.7**	**631.6**	**768.0**	**843.9**	**892.7**	**1,019.7**	**1,053.5**	**990.1**
Maximum On-Site Monthly Total (lb/month)	**506.7**													
Maximum Monthly Total (lb/month)	**1,053.5**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	0.0	14.9	14.9	14.9	14.9	15.4	10.9	16.3	20.5	22.0	22.3	22.3	22.9	22.9
Motor Vehicles	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Total	**0.0**	**15.1**	**15.1**	**15.1**	**15.1**	**15.6**	**11.0**	**16.4**	**20.6**	**22.2**	**22.5**	**22.5**	**23.0**	**23.0**
Off-Site Motor Vehicles	**0.2**	**0.2**	**2.1**	**2.1**	**2.1**	**10.1**	**11.2**	**12.3**	**14.3**	**16.2**	**18.1**	**23.9**	**24.9**	**22.0**
Daily Total	**0.2**	**15.4**	**17.2**	**17.2**	**17.2**	**25.7**	**22.2**	**28.7**	**34.9**	**38.4**	**40.6**	**46.3**	**47.9**	**45.0**
Maximum On-Site Daily Total (lb/day)	**23.0**													
Maximum Off-Site Daily Total (lb/day)	**24.9**													
Maximum Daily Total (lb/day)	**47.9**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	0.0	1.9	1.9	1.9	1.9	2.0	1.8	2.7	3.5	3.7	3.7	3.7	3.8	3.8
Motor Vehicles	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**1.9**	**1.9**	**1.9**	**1.9**	**2.0**	**1.8**	**2.7**	**3.5**	**3.7**	**3.8**	**3.8**	**3.9**	**3.9**
Off-Site Motor Vehicles	**0.1**	**0.1**	**1.3**	**1.3**	**1.3**	**3.2**	**4.0**	**4.6**	**5.8**	**6.9**	**8.0**	**11.4**	**12.0**	**10.3**
Hourly Total	**0.1**	**2.1**	**3.2**	**3.2**	**3.2**	**5.3**	**5.8**	**7.4**	**9.3**	**10.7**	**11.8**	**15.2**	**15.8**	**14.2**
Maximum On-Site Hourly Total (lb/hour)	**3.9**													
Maximum Hourly Total (lb/hour)	**15.8**													

Table 13-C (continued)
Solar Array Construction VOC Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	1.3	1.0	0.8	0.6	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**1.3**	**1.0**	**0.8**	**0.6**	**0.4**	**0.3**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.8**	**0.7**	**0.5**	**0.4**	**0.3**	**0.2**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
12-Month Total	**2.1**	**1.7**	**1.4**	**1.0**	**0.7**	**0.5**	**0.3**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Emissions (lb/month)													
On-Site													
Equipment	504.7	420.8	459.1	438.1	200.0	182.7	176.2	169.6	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	2.0	2.0	2.0	2.0	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0
On-Site Total	**506.7**	**422.8**	**461.1**	**440.1**	**201.5**	**184.3**	**177.7**	**171.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**356.4**	**250.6**	**218.9**	**218.9**	**158.9**	**158.9**	**158.9**	**158.9**	**0.7**	**0.7**	**0.0**	**0.0**	**0.0**
Monthly Total	**863.1**	**673.5**	**680.0**	**659.0**	**360.4**	**343.2**	**336.6**	**330.0**	**0.7**	**0.7**	**0.0**	**0.0**	**0.0**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	22.9	19.1	20.9	19.9	9.1	8.3	8.0	7.7	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
On-Site Total	**23.0**	**19.2**	**21.0**	**20.0**	**9.2**	**8.4**	**8.1**	**7.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**16.2**	**11.4**	**10.0**	**10.0**	**7.2**	**7.2**	**7.2**	**7.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Daily Total	**39.2**	**30.6**	**30.9**	**30.0**	**16.4**	**15.6**	**15.3**	**15.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	3.8	3.2	3.5	3.3	1.5	1.4	1.3	1.3	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**3.9**	**3.2**	**3.5**	**3.3**	**1.6**	**1.4**	**1.4**	**1.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**4.8**	**4.3**	**3.8**	**3.6**	**3.1**	**3.0**	**2.8**	**2.4**	**2.2**	**2.0**	**2.0**	**2.0**	**1.9**
Hourly Total	**8.6**	**7.5**	**7.3**	**7.0**	**4.7**	**4.4**	**4.1**	**3.7**	**2.2**	**2.0**	**2.0**	**2.0**	**1.9**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 13-D
Solar Array Construction Maximum On-Site VOC Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	3.8	22.9	2.7
Motor Vehicles[a]	0.0	0.1	0.0
Maximum On-Site Total	**3.9**	**23.0**	**2.7**

[a] Emissions from source during period with maximum on-site total emissions

Table 13-E
Solar Array Construction NOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
	13.2	14.4	14.3	14.1	13.9	13.7	13.5	13.3	12.7	11.7	10.7	9.5	8.4	7.1
On-Site														
Equipment	13.0	14.2	14.1	13.9	13.7	13.6	13.4	13.2	12.6	11.6	10.6	9.5	8.3	7.1
Motor Vehicles	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
On-Site Total	**13.2**	**14.4**	**14.3**	**14.1**	**13.9**	**13.7**	**13.5**	**13.3**	**12.7**	**11.7**	**10.7**	**9.5**	**8.4**	**7.1**
Off-Site Motor Vehicles	**8.2**	**9.5**	**10.7**	**11.9**	**12.9**	**14.0**	**14.1**	**14.0**	**13.9**	**13.8**	**13.7**	**12.5**	**11.2**	**9.9**
12-Month Total	**21.4**	**23.9**	**25.0**	**26.0**	**26.8**	**27.8**	**27.6**	**27.3**	**26.6**	**25.5**	**24.4**	**22.0**	**19.6**	**17.1**
Maximum On-Site 12-Month Total (ton/year)	**14.4**													
Maximum 12-Month Total (ton/year)	**27.8**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	0.0	2,718.1	2,718.1	2,718.1	2,718.1	2,776.9	1,136.7	1,735.9	2,430.7	2,328.3	2,356.9	2,356.9	2,437.2	2,437.2
Motor Vehicles	0.1	58.7	58.7	58.7	58.7	58.7	23.1	23.1	24.3	24.3	24.3	24.3	17.0	17.0
On-Site Total	**0.1**	**2,776.7**	**2,776.7**	**2,776.7**	**2,776.7**	**2,835.6**	**1,159.9**	**1,759.0**	**2,455.0**	**2,352.6**	**2,381.2**	**2,381.2**	**2,454.2**	**2,454.2**
Off-Site Motor Vehicles	**4.9**	**4.9**	**80.4**	**80.4**	**80.4**	**2,130.6**	**2,211.2**	**2,263.3**	**2,318.6**	**2,357.6**	**2,396.7**	**2,513.9**	**2,533.4**	**2,474.8**
Monthly Total	**4.9**	**2,781.6**	**2,857.1**	**2,857.1**	**2,857.1**	**4,966.2**	**3,371.1**	**4,022.3**	**4,773.6**	**4,710.2**	**4,777.9**	**4,895.1**	**4,987.6**	**4,929.0**
Maximum On-Site Monthly Total (lb/month)	**2,835.6**													
Maximum Monthly Total (lb/month)	**4,987.6**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	0.0	123.5	123.5	123.5	123.5	126.2	51.7	78.9	110.5	105.8	107.1	107.1	110.8	110.8
Motor Vehicles	0.0	2.7	2.7	2.7	2.7	2.7	1.1	1.1	1.1	1.1	1.1	1.1	0.8	0.8
On-Site Total	**0.0**	**126.2**	**126.2**	**126.2**	**126.2**	**128.9**	**52.7**	**80.0**	**111.6**	**106.9**	**108.2**	**108.2**	**111.6**	**111.6**
Off-Site Motor Vehicles	**0.2**	**0.2**	**3.7**	**3.7**	**3.7**	**96.8**	**100.5**	**102.9**	**105.4**	**107.2**	**108.9**	**114.3**	**115.2**	**112.5**
Daily Total	**0.2**	**126.4**	**129.9**	**129.9**	**129.9**	**225.7**	**153.2**	**182.8**	**217.0**	**214.1**	**217.2**	**222.5**	**226.7**	**224.0**
Maximum On-Site Daily Total (lb/day)	**128.9**													
Maximum Off-Site Daily Total (lb/day)	**115.2**													
Maximum Daily Total (lb/day)	**226.7**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	0.0	15.4	15.4	15.4	15.4	16.0	8.7	13.6	19.3	18.5	18.7	18.7	19.3	19.3
Motor Vehicles	0.0	1.2	1.2	1.2	1.2	1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.3
On-Site Total	**0.0**	**16.6**	**16.6**	**16.6**	**16.6**	**17.2**	**9.2**	**14.0**	**19.8**	**19.0**	**19.2**	**19.2**	**19.6**	**19.6**
Off-Site Motor Vehicles	**0.1**	**0.1**	**2.9**	**2.9**	**2.9**	**21.0**	**24.3**	**26.3**	**28.1**	**29.1**	**30.2**	**33.3**	**33.8**	**32.3**
Hourly Total	**0.1**	**16.8**	**19.5**	**19.5**	**19.5**	**38.3**	**33.5**	**40.4**	**47.9**	**48.1**	**49.4**	**52.5**	**53.4**	**51.9**
Maximum On-Site Hourly Total (lb/hour)	**20.0**													
Maximum Hourly Total (lb/hour)	**53.4**													

Table 13-E (continued)
Solar Array Construction NOx Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	5.9	4.6	3.5	2.2	1.0	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**5.9**	**4.7**	**3.6**	**2.3**	**1.1**	**0.7**	**0.5**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**8.7**	**7.5**	**6.4**	**5.3**	**4.2**	**3.1**	**2.1**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
12-Month Total	**14.6**	**12.2**	**9.9**	**7.5**	**5.2**	**3.8**	**2.5**	**1.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Emissions (lb/month)													
On-Site													
Equipment	2,437.2	2,237.8	2,536.1	2,410.8	671.8	498.7	470.1	441.4	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	17.0	17.0	17.0	17.0	9.7	9.7	9.7	9.7	0.0	0.0	0.0	0.0	0.0
On-Site Total	**2,454.2**	**2,254.8**	**2,553.0**	**2,427.8**	**681.4**	**508.4**	**479.7**	**451.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**2,357.6**	**2,260.0**	**2,230.7**	**2,230.7**	**2,076.1**	**2,076.1**	**2,076.1**	**2,076.1**	**0.7**	**0.7**	**0.0**	**0.0**	**0.0**
Monthly Total	**4,811.8**	**4,514.8**	**4,783.8**	**4,658.5**	**2,757.5**	**2,584.5**	**2,555.8**	**2,527.2**	**0.7**	**0.7**	**0.0**	**0.0**	**0.0**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	110.8	101.7	115.3	109.6	30.5	22.7	21.4	20.1	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.8	0.8	0.8	0.8	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0
On-Site Total	**111.6**	**102.5**	**116.0**	**110.4**	**31.0**	**23.1**	**21.8**	**20.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**107.2**	**102.7**	**101.4**	**101.4**	**94.4**	**94.4**	**94.4**	**94.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Daily Total	**218.7**	**205.2**	**217.4**	**211.8**	**125.3**	**117.5**	**116.2**	**114.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	19.3	17.4	19.6	18.7	5.5	4.2	4.0	3.8	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
On-Site Total	**19.6**	**17.7**	**20.0**	**19.0**	**5.7**	**4.4**	**4.2**	**4.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**11.6**	**9.9**	**9.6**	**9.3**	**5.2**	**5.0**	**4.8**	**4.6**	**4.4**	**4.3**	**4.2**	**4.2**	**4.1**
Hourly Total	**31.3**	**27.6**	**29.5**	**28.3**	**10.9**	**9.4**	**8.9**	**8.5**	**4.4**	**4.3**	**4.2**	**4.2**	**4.1**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 13-F
Solar Array Construction Maximum On-Site NOx Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	19.6	126.2	14.2
Motor Vehicles[a]	0.3	2.7	0.2
Maximum On-Site Total	**20.0**	**128.9**	**14.4**

[a] Emissions from source during period with maximum on-site total emissions

Table 13-G
Solar Array Construction SOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
12-Month Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Maximum On-Site 12-Month Total (ton/year)	**0.0**													
Maximum 12-Month Total (ton/year)	**0.0**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	0.0	6.1	6.1	6.1	6.1	6.2	1.2	1.9	2.6	2.6	2.6	2.6	2.7	2.7
Motor Vehicles	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**1.3**	**2.0**	**2.6**	**2.6**	**2.6**	**2.6**	**2.7**	**2.7**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**4.5**	**4.6**	**4.7**	**4.7**	**4.7**	**4.7**	**4.7**	**4.7**	**4.7**
Monthly Total	**0.0**	**6.3**	**6.3**	**6.3**	**6.3**	**10.8**	**5.9**	**6.6**	**7.3**	**7.3**	**7.3**	**7.3**	**7.4**	**7.4**
Maximum On-Site Monthly Total (lb/month)	**6.3**													
Maximum Monthly Total (lb/month)	**10.8**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	0.0	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Daily Total	**0.0**	**0.3**	**0.3**	**0.3**	**0.3**	**0.5**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Maximum On-Site Daily Total (lb/day)	**0.3**													
Maximum Off-Site Daily Total (lb/day)	**0.2**													
Maximum Daily Total (lb/day)	**0.5**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Hourly Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Maximum On-Site Hourly Total (lb/hour)	**0.0**													
Maximum Hourly Total (lb/hour)	**0.1**													

Table 13-G (continued)
Solar Array Construction SOx Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
12-Month Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Emissions (lb/month)													
On-Site													
Equipment	2.7	2.5	2.7	2.6	0.8	0.6	0.6	0.5	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**2.7**	**2.5**	**2.8**	**2.7**	**0.8**	**0.6**	**0.6**	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**4.7**	**4.7**	**4.7**	**4.7**	**4.5**	**4.5**	**4.5**	**4.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Total	**7.4**	**7.2**	**7.4**	**7.3**	**5.3**	**5.1**	**5.1**	**5.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Daily Total	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Hourly Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 13-H
Solar Array Construction Maximum On-Site SOx Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	0.0	0.3	0.0
Motor Vehicles[a]	0.0	0.0	0.0
Maximum On-Site Total	**0.0**	**0.3**	**0.0**

[a] Emissions from source during period with maximum on-site total emissions

Table 13-I
Solar Array Construction PM10 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.7	0.6
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	3.4	3.4	3.4	3.1	2.9	2.6	2.8	2.9	3.0	3.0	2.9	2.7	2.4	2.2
On-Site Total	**4.2**	**4.3**	**4.3**	**4.1**	**3.8**	**3.6**	**3.8**	**3.9**	**3.9**	**3.9**	**3.8**	**3.4**	**3.1**	**2.8**
Off-Site Motor Vehicle Exhaust and Fugitive	**1.4**	**1.7**	**1.9**	**2.1**	**2.2**	**2.3**	**2.3**	**2.3**	**2.2**	**2.1**	**2.0**	**1.8**	**1.5**	**1.2**
12-Month Total	**5.6**	**6.0**	**6.3**	**6.2**	**6.1**	**5.9**	**6.1**	**6.1**	**6.1**	**6.0**	**5.8**	**5.2**	**4.6**	**3.9**
Maximum On-Site 12-Month Total (ton/year)	**4.3**													
Maximum 12-Month Total (ton/year)	**6.3**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	0.0	124.7	124.7	124.7	124.7	129.9	89.2	133.9	174.6	182.0	184.0	184.0	191.4	191.4
Motor Vehicle Exhaust	0.0	2.4	2.4	2.4	2.4	2.4	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.6
Fugitive	526.4	526.7	1,037.0	1,037.0	1,037.0	173.5	288.0	288.0	494.4	494.4	494.4	494.4	494.3	494.3
On-Site Total	**526.4**	**653.8**	**1,164.1**	**1,164.1**	**1,164.1**	**305.9**	**378.1**	**422.8**	**669.9**	**677.3**	**679.3**	**679.3**	**686.3**	**686.3**
Off-Site Motor Vehicle Exhaust and Fugitive	**6.3**	**6.3**	**53.7**	**53.7**	**53.7**	**236.0**	**265.2**	**292.5**	**343.7**	**393.8**	**443.9**	**594.2**	**619.2**	**544.1**
Monthly Total	**532.7**	**660.1**	**1,217.8**	**1,217.8**	**1,217.8**	**541.9**	**643.4**	**715.3**	**1,013.6**	**1,071.1**	**1,123.2**	**1,273.4**	**1,305.5**	**1,230.4**
Maximum On-Site Monthly Total (lb/month)	**1,164.1**													
Maximum Monthly Total (lb/month)	**1,305.5**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	0.0	5.7	5.7	5.7	5.7	5.9	4.1	6.1	7.9	8.3	8.4	8.4	8.7	8.7
Motor Vehicle Exhaust	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	23.9	23.9	47.1	47.1	47.1	7.9	13.1	13.1	22.5	22.5	22.5	22.5	22.5	22.5
On-Site Total	**23.9**	**29.7**	**52.9**	**52.9**	**52.9**	**13.9**	**17.2**	**19.2**	**30.4**	**30.8**	**30.9**	**30.9**	**31.2**	**31.2**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.3**	**0.3**	**2.4**	**2.4**	**2.4**	**10.7**	**12.1**	**13.3**	**15.6**	**17.9**	**20.2**	**27.0**	**28.1**	**24.7**
Daily Total	**24.2**	**30.0**	**55.4**	**55.4**	**55.4**	**24.6**	**29.2**	**32.5**	**46.1**	**48.7**	**51.1**	**57.9**	**59.3**	**55.9**
Maximum On-Site Daily Total (lb/day)	**52.9**													
Maximum Off-Site Daily Total (lb/day)	**28.1**													
Maximum Daily Total (lb/day)	**59.3**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	0.0	0.7	0.7	0.7	0.7	0.8	0.7	1.0	1.4	1.4	1.4	1.4	1.5	1.5
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	2.1	4.6	6.3	6.3	6.3	4.6	4.8	4.8	9.0	9.0	9.0	9.0	9.0	9.0
On-Site Total	**2.1**	**5.3**	**7.1**	**7.1**	**7.1**	**5.4**	**5.5**	**5.8**	**10.3**	**10.4**	**10.4**	**10.4**	**10.5**	**10.5**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.2**	**0.2**	**1.5**	**1.5**	**1.5**	**3.5**	**4.4**	**5.2**	**6.5**	**7.9**	**9.2**	**13.2**	**13.8**	**11.9**
Hourly Total	**2.3**	**5.5**	**8.5**	**8.5**	**8.5**	**8.9**	**9.9**	**11.0**	**16.9**	**18.3**	**19.6**	**23.6**	**24.3**	**22.3**
Maximum On-Site Hourly Total (lb/hour)	**10.5**													
Maximum Hourly Total (lb/hour)	**24.3**													

Table 13-I (continued)
Solar Array Construction PM10 Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	1.9	1.7	1.4	1.2	0.9	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0
On-Site Total	**2.4**	**2.1**	**1.8**	**1.4**	**1.1**	**0.8**	**0.5**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.9**	**0.7**	**0.6**	**0.4**	**0.3**	**0.2**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
12-Month Total	**3.3**	**2.8**	**2.3**	**1.9**	**1.4**	**1.0**	**0.7**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Emissions (lb/month)													
On-Site													
Equipment	191.4	157.7	174.9	164.3	75.3	68.8	66.7	64.7	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Exhaust	0.6	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Fugitive	494.3	494.3	494.3	494.3	494.3	494.3	494.3	412.8	0.0	0.0	0.0	0.0	0.0
On-Site Total	**686.3**	**652.6**	**669.9**	**659.2**	**569.9**	**563.4**	**561.3**	**477.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**393.8**	**268.6**	**231.0**	**231.0**	**161.2**	**161.2**	**161.2**	**161.2**	**0.8**	**0.8**	**0.0**	**0.0**	**0.0**
Monthly Total	**1,080.1**	**921.2**	**900.9**	**890.2**	**731.1**	**724.5**	**722.5**	**639.0**	**0.8**	**0.8**	**0.0**	**0.0**	**0.0**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	8.7	7.2	8.0	7.5	3.4	3.1	3.0	2.9	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	22.5	22.5	22.5	22.5	22.5	22.5	22.5	18.8	0.0	0.0	0.0	0.0	0.0
On-Site Total	**31.2**	**29.7**	**30.4**	**30.0**	**25.9**	**25.6**	**25.5**	**21.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**17.9**	**12.2**	**10.5**	**10.5**	**7.3**	**7.3**	**7.3**	**7.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Daily Total	**49.1**	**41.9**	**40.9**	**40.5**	**33.2**	**32.9**	**32.8**	**29.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	1.5	1.2	1.3	1.3	0.6	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**10.5**	**10.2**	**10.3**	**10.2**	**9.6**	**9.5**	**9.5**	**9.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**5.5**	**4.9**	**4.4**	**4.2**	**3.7**	**3.5**	**3.2**	**2.8**	**2.6**	**2.4**	**2.3**	**2.3**	**2.2**
Hourly Total	**15.9**	**15.1**	**14.7**	**14.4**	**13.2**	**13.0**	**12.7**	**12.2**	**2.6**	**2.4**	**2.3**	**2.3**	**2.2**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 13-J
Solar Array Construction Maximum On-Site PM10 Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	1.5	5.7	0.9
Motor Vehicle Exhaust[a]	0.0	0.1	0.0
Fugitive[a]	9.0	47.1	3.4
Maximum On-Site Total	**10.5**	**52.9**	**4.3**

[a] Emissions from source during period with maximum on-site total emissions

Table 13-K
Solar Array Construction PM2.5 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
12-Month Running Emissions (ton/year)[a]														
On-Site														
Equipment	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.5
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	0.7	0.7	0.7	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
On-Site Total	**1.4**	**1.5**	**1.5**	**1.5**	**1.4**	**1.4**	**1.5**	**1.5**	**1.5**	**1.4**	**1.4**	**1.2**	**1.1**	**1.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.5**	**0.6**	**0.7**	**0.8**	**0.8**	**0.9**	**0.9**	**0.8**	**0.8**	**0.8**	**0.8**	**0.7**	**0.6**	**0.5**
12-Month Total	**1.9**	**2.1**	**2.2**	**2.3**	**2.3**	**2.3**	**2.3**	**2.3**	**2.3**	**2.2**	**2.1**	**1.9**	**1.7**	**1.5**
Maximum On-Site 12-Month Total (ton/year)	**1.5**													
Maximum 12-Month Total (ton/year)	**2.3**													
Monthly Emissions (lb/month)														
On-Site														
Equipment	0.0	114.8	114.8	114.8	114.8	119.6	76.2	114.3	151.7	155.6	157.4	157.4	164.2	164.2
Motor Vehicle Exhaust	0.0	2.2	2.2	2.2	2.2	2.2	0.8	0.8	0.8	0.8	0.8	0.8	0.6	0.6
Fugitive	109.9	109.9	216.1	216.1	216.1	36.5	60.7	60.7	104.5	104.5	104.5	104.5	104.5	104.5
On-Site Total	**109.9**	**226.9**	**333.1**	**333.1**	**333.1**	**158.3**	**137.7**	**175.9**	**257.1**	**260.9**	**262.8**	**262.8**	**269.3**	**269.3**
Off-Site Motor Vehicle Exhaust and Fugitive	**1.3**	**3.5**	**14.4**	**14.4**	**14.4**	**110.8**	**117.2**	**123.7**	**134.7**	**144.9**	**155.2**	**185.9**	**190.8**	**175.4**
Monthly Total	**111.2**	**230.5**	**347.5**	**347.5**	**347.5**	**269.1**	**254.9**	**299.6**	**391.7**	**405.8**	**418.0**	**448.7**	**460.1**	**444.7**
Maximum On-Site Monthly Total (lb/month)	**333.1**													
Maximum Monthly Total (lb/month)	**460.1**													
Daily Emissions (lb/day)[b]														
On-Site														
Equipment	0.0	5.2	5.2	5.2	5.2	5.4	3.5	5.2	6.9	7.1	7.2	7.2	7.5	7.5
Motor Vehicle Exhaust	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	5.0	5.0	9.8	9.8	9.8	1.7	2.8	2.8	4.7	4.7	4.7	4.7	4.7	4.7
On-Site Total	**5.0**	**10.3**	**15.1**	**15.1**	**15.1**	**7.2**	**6.3**	**8.0**	**11.7**	**11.9**	**11.9**	**11.9**	**12.2**	**12.2**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.1**	**0.2**	**0.7**	**0.7**	**0.7**	**5.0**	**5.3**	**5.6**	**6.1**	**6.6**	**7.1**	**8.5**	**8.7**	**8.0**
Daily Total	**5.1**	**10.5**	**15.8**	**15.8**	**15.8**	**12.2**	**11.6**	**13.6**	**17.8**	**18.4**	**19.0**	**20.4**	**20.9**	**20.2**
Maximum On-Site Daily Total (lb/day)	**15.1**													
Maximum Off-Site Daily Total (lb/day)	**8.7**													
Maximum Daily Total (lb/day)	**20.9**													
Hourly Emissions (lb/hour)[c]														
On-Site														
Equipment	0.0	0.7	0.7	0.7	0.7	0.7	0.6	0.9	1.2	1.2	1.2	1.2	1.3	1.3
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	0.4	1.0	1.3	1.3	1.3	1.0	1.0	1.0	1.9	1.9	1.9	1.9	1.9	1.9
On-Site Total	**0.4**	**1.7**	**2.0**	**2.0**	**2.0**	**1.7**	**1.6**	**1.9**	**3.1**	**3.1**	**3.1**	**3.1**	**3.2**	**3.2**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.0**	**0.1**	**0.4**	**0.4**	**0.4**	**1.3**	**1.6**	**1.8**	**2.1**	**2.3**	**2.6**	**3.4**	**3.6**	**3.2**
Hourly Total	**0.5**	**1.7**	**2.4**	**2.4**	**2.4**	**3.0**	**3.2**	**3.7**	**5.2**	**5.5**	**5.8**	**6.6**	**6.8**	**6.3**
Maximum On-Site Hourly Total (lb/hour)	**3.2**													
Maximum Hourly Total (lb/hour)	**6.8**													

Table 13-K (continued)
Solar Array Construction PM2.5 Emissions Summary

	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
12-Month Running Emissions (ton/yr)[a]													
On-Site													
Equipment	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.8**	**0.7**	**0.6**	**0.4**	**0.3**	**0.2**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.4**	**0.4**	**0.3**	**0.2**	**0.2**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
12-Month Total	**1.3**	**1.0**	**0.9**	**0.7**	**0.5**	**0.4**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Emissions (lb/month)													
On-Site													
Equipment	164.2	136.2	152.0	142.2	63.4	57.3	55.5	53.6	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Exhaust	0.6	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Fugitive	104.5	104.5	104.5	104.5	104.5	104.5	104.5	87.5	0.0	0.0	0.0	0.0	0.0
On-Site Total	**269.3**	**241.2**	**257.1**	**247.3**	**168.1**	**162.1**	**160.2**	**141.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**144.6**	**119.0**	**111.3**	**111.3**	**93.6**	**93.6**	**93.6**	**93.6**	**0.2**	**0.2**	**0.0**	**0.0**	**0.0**
Monthly Total	**413.9**	**360.2**	**368.4**	**358.6**	**261.8**	**255.7**	**253.8**	**235.0**	**0.2**	**0.2**	**0.0**	**0.0**	**0.0**
Daily Emissions (lb/day)[b]													
On-Site													
Equipment	7.5	6.2	6.9	6.5	2.9	2.6	2.5	2.4	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**12.2**	**11.0**	**11.7**	**11.2**	**7.6**	**7.4**	**7.3**	**6.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**6.6**	**5.4**	**5.1**	**5.1**	**4.3**	**4.3**	**4.3**	**4.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Daily Total	**18.8**	**16.4**	**16.7**	**16.3**	**11.9**	**11.6**	**11.5**	**10.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Hourly Emissions (lb/hour)[c]													
On-Site													
Equipment	1.3	1.0	1.2	1.1	0.5	0.5	0.4	0.4	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	0.0	0.0	0.0	0.0	0.0
On-Site Total	**3.2**	**3.0**	**3.1**	**3.0**	**2.4**	**2.4**	**2.3**	**2.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**1.4**	**1.2**	**1.1**	**1.1**	**0.8**	**0.8**	**0.7**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**
Hourly Total	**4.5**	**4.2**	**4.2**	**4.1**	**3.2**	**3.1**	**3.1**	**3.0**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**

[a] The value for each month is the total for that month and the next 11 months

[b] Daily emissions = Monthly emissions / 22 working days/month

[c] Hourly emissions are based on simultaneous operation of all emission sources

Table 13-L
Solar Array Construction Maximum On-Site PM2.5 Emissions Summary

Source	Hourly (lb/hr)	Daily (lb/day)	Annual (ton/yr)
Equipment[a]	1.3	5.2	0.8
Motor Vehicle Exhaust[a]	0.0	0.1	0.0
Fugitive[a]	1.9	9.8	0.7
Maximum On-Site Total	**3.2**	**15.1**	**1.5**

[a] Emissions from source during period with maximum on-site total emissions

Table 14-A
Emission Rates for Modeling Impacts During Construction of Combined Cycle Facility

Pollutant	Source	Averaging Period	Emission Rate (lb/hr)	How Calculated
CO	Construction Equipment	1-hr	4.10E+01	Maximum hourly (lb/hr)
CO	On-site Motor Vehicles	1-hr	5.89E-01	Maximum hourly (lb/hr)
CO	Construction Equipment	8-hr	4.10E+01	Maximum hourly (lb/hr)
CO	On-site Motor Vehicles	8-hr	5.89E-01	Maximum hourly (lb/hr)
NO2	Construction Equipment	1-hr	2.21E+01	Maximum hourly (lb/hr)
NO2	On-site Motor Vehicles	1-hr	4.07E-01	Maximum hourly (lb/hr)
NO2	Construction Equipment	Annual	6.67E+00	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
NO2	On-site Motor Vehicles	Annual	5.88E-02	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
SO2	Construction Equipment	1-hr	2.24E-02	Maximum hourly (lb/hr)
SO2	On-site Motor Vehicles	1-hr	8.66E-04	Maximum hourly (lb/hr)
SO2	Construction Equipment	3-hr	2.24E-02	Maximum hourly (lb/hr)
SO2	On-site Motor Vehicles	3-hr	8.66E-04	Maximum hourly (lb/hr)
SO2	Construction Equipment	24-hr	1.08E-02	Max. daily (lb/day)/10 hr. per day
SO2	On-site Motor Vehicles	24-hr	1.83E-04	Max. daily/10 hr. per day
SO2	Construction Equipment	Annual	6.88E-03	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
SO2	On-site Motor Vehicles	Annual	1.24E-04	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM10	Construction Equipment	24-hr	7.79E-01	Max. daily (lb/day)/10 hr. per day
PM10	On-site Motor Vehicles	24-hr	2.87E-03	Max. daily (lb/day)/10 hr. per day
PM10	Fugitive Emissions	24-hr	5.58E+00	Max. daily (lb/day)/10 hr. per day
PM10	Construction Equipment	Annual	4.99E-01	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM10	On-site Motor Vehicles	Annual	1.94E-03	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM10	Fugitive Emissions	Annual	3.82E+00	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM2.5	Construction Equipment	24-hr	6.76E-01	Max. daily (lb/day)/10 hr. per day
PM2.5	On-site Motor Vehicles	24-hr	2.64E-03	Max. daily (lb/day)/10 hr. per day
PM2.5	Fugitive Emissions	24-hr	1.18E+00	Max. daily (lb/day)/10 hr. per day
PM2.5	Construction Equipment	Annual	4.35E-01	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM2.5	On-site Motor Vehicles	Annual	1.82E-03	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM2.5	Fugitive Emissions	Annual	8.08E-01	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day

Table 14-B
Emission Rates for Modeling Impacts During Construction of Solar Array

Pollutant	Source	Averaging Period	Emission Rate (lb/hr)	How Calculated
CO	Construction Equipment	1-hr	5.09E+01	Maximum hourly (lb/hr)
CO	On-site Motor Vehicles	1-hr	3.82E-01	Maximum hourly (lb/hr)
CO	Construction Equipment	8-hr	5.09E+01	Maximum hourly (lb/hr)
CO	On-site Motor Vehicles	8-hr	3.82E-01	Maximum hourly (lb/hr)
NO2	Construction Equipment	1-hr	1.96E+01	Maximum hourly (lb/hr)
NO2	On-site Motor Vehicles	1-hr	3.39E-01	Maximum hourly (lb/hr)
NO2	Construction Equipment	Annual	7.79E+00	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
NO2	On-site Motor Vehicles	Annual	1.24E-01	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
SO2	Construction Equipment	1-hr	3.55E-02	Maximum hourly (lb/hr)
SO2	On-site Motor Vehicles	1-hr	2.34E-03	Maximum hourly (lb/hr)
SO2	Construction Equipment	3-hr	3.55E-02	Maximum hourly (lb/hr)
SO2	On-site Motor Vehicles	3-hr	2.34E-03	Maximum hourly (lb/hr)
SO2	Construction Equipment	24-hr	2.82E-02	Max. daily (lb/day)/10 hr. per day
SO2	On-site Motor Vehicles	24-hr	5.27E-04	Max. daily/10 hr. per day
SO2	Construction Equipment	Annual	1.29E-02	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
SO2	On-site Motor Vehicles	Annual	2.38E-04	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM10	Construction Equipment	24-hr	5.67E-01	Max. daily (lb/day)/10 hr. per day
PM10	On-site Motor Vehicles	24-hr	1.11E-02	Max. daily (lb/day)/10 hr. per day
PM10	Fugitive Emissions	24-hr	4.71E+00	Max. daily (lb/day)/10 hr. per day
PM10	Construction Equipment	Annual	5.03E-01	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM10	On-site Motor Vehicles	Annual	4.52E-03	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM10	Fugitive Emissions	Annual	1.87E+00	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM2.5	Construction Equipment	24-hr	5.22E-01	Max. daily (lb/day)/10 hr. per day
PM2.5	On-site Motor Vehicles	24-hr	1.02E-02	Max. daily (lb/day)/10 hr. per day
PM2.5	Fugitive Emissions	24-hr	9.82E-01	Max. daily (lb/day)/10 hr. per day
PM2.5	Construction Equipment	Annual	4.40E-01	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM2.5	On-site Motor Vehicles	Annual	4.16E-03	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day
PM2.5	Fugitive Emissions	Annual	3.93E-01	Max. Annual (ton/yr)x2000 (lb/ton) /365 days per year/10 hr. per day

Table 15-A
Reclaimed Water Pipeline Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number								
			Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
			1	2	3	4	5	6	7	8	9
Construction Equipment											
Compressor, 250 cfm	Diesel	8	3	3	3	3	6	6	6	6	6
Tractor/Loader/Backhoe	Diesel	3	3	6	0	0	6	6	0	0	0
Backhoe	Diesel	3	0	3	3	0	0	6	6	0	0
Crane, 5 ton	Diesel	3	3	3	3	3	6	6	6	6	6
Welder	Diesel	6	3	3	3	3	6	6	6	6	6
Vibratory Compactor	Diesel	2	0	3	3	3	0	0	6	6	6
Roller, 5 ton	Diesel	2	0	3	3	3	0	0	6	6	6
Motor Vehicles											
Off-Site Vehicles											
Off-Site Dump Trucks	Diesel	40	0	3	3	3	0	0	3	3	3
Off-Site Pipe Hauling Trucks	Diesel	14	3	3	3	3	3	3	3	3	3
Off-Site Construction Worker Commute	Gasoline	60	144	144	144	144	216	216	216	216	216

Table 15-B
Reclaimed Water Pipeline Construction Daily Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Daily Operating Hours or Miles								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment										
Compressor, 250 cfm	Diesel	24	24	24	24	48	48	48	48	48
Tractor/Loader/Backhoe	Diesel	9	18	0	0	18	18	0	0	0
Backhoe	Diesel	0	9	9	0	0	18	18	0	0
Crane, 5 ton	Diesel	9	9	9	9	18	18	18	18	18
Welder	Diesel	18	18	18	18	36	36	36	36	36
Vibratory Compactor	Diesel	0	6	6	6	0	0	12	12	12
Roller, 5 ton	Diesel	0	6	6	6	0	0	12	12	12
Motor Vehicles										
Off-Site Vehicles										
Off-Site Dump Trucks	Diesel	0	120	120	120	0	0	120	120	120
Off-Site Pipe Hauling Trucks	Diesel	42	42	42	42	42	42	42	42	42
Off-Site Construction Worker Commute	Gasoline	8,640	8,640	8,640	8,640	12,960	12,960	12,960	12,960	12,960

Table 15-C
Reclaimed Water Pipeline Construction Daily Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment										
Compressor, 250 cfm	0.3302	7.9	7.9	7.9	7.9	15.8	15.8	15.8	15.8	15.8
Tractor/Loader/Backhoe	0.3664	3.3	6.6	0.0	0.0	6.6	6.6	0.0	0.0	0.0
Backhoe	0.3694	0.0	3.3	3.3	0.0	0.0	6.6	6.6	0.0	0.0
Crane, 5 ton	0.3763	3.4	3.4	3.4	3.4	6.8	6.8	6.8	6.8	6.8
Welder	0.2908	5.2	5.2	5.2	5.2	10.5	10.5	10.5	10.5	10.5
Vibratory Compactor	0.4218	0.0	2.5	2.5	2.5	0.0	0.0	5.1	5.1	5.1
Roller, 5 ton	0.4218	0.0	2.5	2.5	2.5	0.0	0.0	5.1	5.1	5.1
Construction Equipment Total		**19.8**	**31.5**	**24.9**	**21.6**	**39.7**	**46.3**	**49.9**	**43.2**	**43.2**
Motor Vehicles										
Off-Site Vehicles										
Off-Site Dump Trucks	0.0104	0.0	1.2	1.2	1.2	0.0	0.0	1.2	1.2	1.2
Off-Site Pipe Hauling Trucks	0.0104	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Construction Worker Commute	0.0087	75.4	75.4	75.4	75.4	113.0	113.0	113.0	113.0	113.0
Off-Site Motor Vehicle Total		**75.8**	**77.0**	**77.0**	**77.0**	**113.5**	**113.5**	**114.7**	**114.7**	**114.7**

Table 15-D
Reclaimed Water Pipeline Construction Daily Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment										
Compressor, 250 cfm	0.0986	2.4	2.4	2.4	2.4	4.7	4.7	4.7	4.7	4.7
Tractor/Loader/Backhoe	0.1000	0.9	1.8	0.0	0.0	1.8	1.8	0.0	0.0	0.0
Backhoe	0.1403	0.0	1.3	1.3	0.0	0.0	2.5	2.5	0.0	0.0
Crane, 5 ton	0.1191	1.1	1.1	1.1	1.1	2.1	2.1	2.1	2.1	2.1
Welder	0.1173	2.1	2.1	2.1	2.1	4.2	4.2	4.2	4.2	4.2
Vibratory Compactor	0.1282	0.0	0.8	0.8	0.8	0.0	0.0	1.5	1.5	1.5
Roller, 5 ton	0.1282	0.0	0.8	0.8	0.8	0.0	0.0	1.5	1.5	1.5
Construction Equipment Total		**6.4**	**10.2**	**8.4**	**7.1**	**12.9**	**15.4**	**16.7**	**14.2**	**14.2**
Motor Vehicles										
Off-Site Vehicles										
Off-Site Dump Trucks	0.0025	0.0	0.3	0.3	0.3	0.0	0.0	0.3	0.3	0.3
Off-Site Pipe Hauling Trucks	0.0025	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Construction Worker Commute	0.0008	6.9	6.9	6.9	6.9	10.4	10.4	10.4	10.4	10.4
Off-Site Motor Vehicle Total		**7.0**	**7.3**	**7.3**	**7.3**	**10.5**	**10.5**	**10.8**	**10.8**	**10.8**

Table 15-E
Reclaimed Water Pipeline Construction Daily Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment										
Compressor, 250 cfm	0.5945	14.3	14.3	14.3	14.3	28.5	28.5	28.5	28.5	28.5
Tractor/Loader/Backhoe	0.6082	5.5	10.9	0.0	0.0	10.9	10.9	0.0	0.0	0.0
Backhoe	0.3165	0.0	2.8	2.8	0.0	0.0	5.7	5.7	0.0	0.0
Crane, 5 ton	0.6897	6.2	6.2	6.2	6.2	12.4	12.4	12.4	12.4	12.4
Welder	0.2691	4.8	4.8	4.8	4.8	9.7	9.7	9.7	9.7	9.7
Vibratory Compactor	0.7773	0.0	4.7	4.7	4.7	0.0	0.0	9.3	9.3	9.3
Roller, 5 ton	0.7773	0.0	4.7	4.7	4.7	0.0	0.0	9.3	9.3	9.3
Construction Equipment Total		**30.8**	**48.4**	**37.5**	**34.6**	**61.6**	**67.3**	**75.0**	**69.3**	**69.3**
Motor Vehicles										
Off-Site Vehicles										
Off-Site Dump Trucks	0.0370	0.0	4.4	4.4	4.4	0.0	0.0	4.4	4.4	4.4
Off-Site Pipe Hauling Trucks	0.0370	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Off-Site Construction Worker Commute	0.0007	6.4	6.4	6.4	6.4	9.6	9.6	9.6	9.6	9.6
Off-Site Motor Vehicle Total		**7.9**	**12.4**	**12.4**	**12.4**	**11.1**	**11.1**	**15.6**	**15.6**	**15.6**

Table 15-F
Reclaimed Water Pipeline Construction Daily Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment										
Compressor, 250 cfm	0.00055	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tractor/Loader/Backhoe	0.00061	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe	0.00039	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.00059	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder	0.00034	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vibratory Compactor	0.00069	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.00069	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Motor Vehicles										
Off-Site Vehicles										
Off-Site Dump Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 15-G
Reclaimed Water Pipeline Construction Daily Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment										
Compressor, 250 cfm	0.05268	1.3	1.3	1.3	1.3	2.5	2.5	2.5	2.5	2.5
Tractor/Loader/Backhoe	0.05583	0.5	1.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0
Backhoe	0.03381	0.0	0.3	0.3	0.0	0.0	0.6	0.6	0.0	0.0
Crane, 5 ton	0.06359	0.6	0.6	0.6	0.6	1.1	1.1	1.1	1.1	1.1
Welder	0.02796	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0
Vibratory Compactor	0.06738	0.0	0.4	0.4	0.4	0.0	0.0	0.8	0.8	0.8
Roller, 5 ton	0.06738	0.0	0.4	0.4	0.4	0.0	0.0	0.8	0.8	0.8
Construction Equipment Total		**2.8**	**4.5**	**3.5**	**3.1**	**5.7**	**6.3**	**6.9**	**6.3**	**6.3**
Motor Vehicles										
Off-Site Vehicles										
Off-Site Dump Trucks	0.00154	0.0	0.2	0.2	0.2	0.0	0.0	0.2	0.2	0.2
Off-Site Pipe Hauling Trucks	0.00154	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Construction Worker Commute	0.00003	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Off-Site Motor Vehicle Total		**0.3**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**

Table 15-H
Reclaimed Water Pipeline Construction Daily Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment										
Compressor, 250 cfm	0.04847	1.2	1.2	1.2	1.2	2.3	2.3	2.3	2.3	2.3
Tractor/Loader/Backhoe	0.05137	0.5	0.9	0.0	0.0	0.9	0.9	0.0	0.0	0.0
Backhoe	0.03110	0.0	0.3	0.3	0.0	0.0	0.6	0.6	0.0	0.0
Crane, 5 ton	0.05850	0.5	0.5	0.5	0.5	1.1	1.1	1.1	1.1	1.1
Welder	0.02572	0.5	0.5	0.5	0.5	0.9	0.9	0.9	0.9	0.9
Vibratory Compactor	0.06199	0.0	0.4	0.4	0.4	0.0	0.0	0.7	0.7	0.7
Roller, 5 ton	0.06199	0.0	0.4	0.4	0.4	0.0	0.0	0.7	0.7	0.7
Construction Equipment Total		**2.6**	**4.1**	**3.2**	**2.9**	**5.2**	**5.8**	**6.4**	**5.8**	**5.8**
Motor Vehicles										
Off-Site Vehicles										
Off-Site Dump Trucks	0.00142	0.0	0.2	0.2	0.2	0.0	0.0	0.2	0.2	0.2
Off-Site Pipe Hauling Trucks	0.00142	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Construction Worker Commute	0.00003	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4
Off-Site Motor Vehicle Total		**0.3**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.6**	**0.6**	**0.6**

Table 15-I
Reclaimed Water Pipeline Construction Daily Motor Vehicle Fugitive PM10 Emissions

Vehicle Type	Emission Factor (lb/mile)	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Off-Site Vehicles										
Off-Site Dump Trucks	0.00100	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1
Off-Site Pipe Hauling Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	7.9	7.9	7.9	7.9	11.9	11.9	11.9	11.9	11.9
Off-Site Motor Vehicle Total		**8.0**	**8.1**	**8.1**	**8.1**	**11.9**	**11.9**	**12.1**	**12.1**	**12.1**

Table 15-J
Reclaimed Water Pipeline Construction Daily Motor Vehicle Fugitive PM2.5 Emissions

Vehicle Type	Emission Factor (lb/mile)	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Off-Site Vehicles										
Off-Site Dump Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	1.4	1.4	1.4	1.4	2.1	2.1	2.1	2.1	2.1
Off-Site Motor Vehicle Total		**1.4**	**1.5**	**1.5**	**1.5**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**

Table 15-K
Reclaimed Water Pipeline Construction Daily Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Day								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Excavation[a]	Cu. Yd.	185	185	185	185	185	185	185	185	185
Storage Pile Wind Erosion[b]	Acres	7.56	7.56	7.56	7.56	7.56	7.56	7.56	7.56	7.56

[a] Total excavation is 4 ft. wide x 6 ft. deep x 7.8 mi. long, assumed to occur at a constant rate, during 22 working days per month.

[b] Based 4 ft. wide x 6 ft. tall x 7.8 mi. long and assuming 50 percent is stockpiled at any time.

Table 15-L
Reclaimed Water Pipeline Construction Daily Fugitive PM10 Emissions

Activity	Emission Factor	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Excavation	9.94E-04	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Storage Pile Wind Erosion	4.3	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5
Total		**32.6**	**32.6**	**32.6**	**32.6**	**32.6**	**32.6**	**32.6**	**32.6**	**32.6**

Table 15-M
Reclaimed Water Pipeline Construction Daily Fugitive PM2.5 Emissions

Activity	Emission Factor	Daily Emissions (lb/day)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Excavation	2.07E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.9	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
Total		**6.8**	**6.8**	**6.8**	**6.8**	**6.8**	**6.8**	**6.8**	**6.8**	**6.8**

Table 16-A
Natural Gas Pipeline Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number														
			Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Construction Equipment																	
Compressor, 250 cfm	Diesel	8	3	3	3	3	6	6	6	6	6	6	6	6	6	6	6
Tractor/Loader/Backhoe	Diesel	3	3	6	0	0	6	6	0	0	0	0	0	0	0	0	0
Backhoe	Diesel	3	0	3	3	0	0	6	6	0	0	0	0	0	0	0	0
Crane, 5 ton	Diesel	3	3	3	3	3	6	6	6	6	6	6	6	6	6	6	6
Welder	Diesel	6	3	3	3	3	6	6	6	6	6	6	6	6	6	6	6
Vibratory Compactor	Diesel	2	0	3	3	3	0	0	6	6	6	6	6	6	6	6	6
Roller, 5 ton	Diesel	2	0	3	3	3	0	0	6	6	6	6	6	6	6	6	6
Motor Vehicles																	
Off-Site Vehicles																	
Off-Site Dump Trucks	Diesel	40	0	3	3	3	0	0	3	3	3	3	3	3	3	3	3
Off-Site Pipe Hauling Trucks	Diesel	14	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Off-Site Construction Worker Commute	Gasoline	60	144	144	144	144	216	216	216	216	216	216	216	216	216	216	216

Table 16-B
Natural Gas Pipeline Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Daily Operating Hours or Miles														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Compressor, 250 cfm	Diesel	24	24	24	24	48	48	48	48	48	48	48	48	48	48	48
Tractor/Loader/Backhoe	Diesel	9	18	0	0	18	18	0	0	0	0	0	0	0	0	0
Backhoe	Diesel	0	9	9	0	0	18	18	0	0	0	0	0	0	0	0
Crane, 5 ton	Diesel	9	9	9	9	18	18	18	18	18	18	18	18	18	18	18
Welder	Diesel	18	18	18	18	36	36	36	36	36	36	36	36	36	36	36
Vibratory Compactor	Diesel	0	6	6	6	0	0	12	12	12	12	12	12	12	12	12
Roller, 5 ton	Diesel	0	6	6	6	0	0	12	12	12	12	12	12	12	12	12
Motor Vehicles																
Off-Site Vehicles																
Off-Site Dump Trucks	Diesel	0	120	120	120	0	0	120	120	120	120	120	120	120	120	120
Off-Site Pipe Hauling Trucks	Diesel	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Off-Site Construction Worker Commute	Gasoline	8,640	8,640	8,640	8,640	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960

Table 16-C
Natural Gas Pipeline Construction Daily Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Compressor, 250 cfm	0.3302	7.9	7.9	7.9	7.9	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8
Tractor/Loader/Backhoe	0.3664	3.3	6.6	0.0	0.0	6.6	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe	0.3694	0.0	3.3	3.3	0.0	0.0	6.6	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.3763	3.4	3.4	3.4	3.4	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
Welder	0.2908	5.2	5.2	5.2	5.2	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
Vibratory Compactor	0.4218	0.0	2.5	2.5	2.5	0.0	0.0	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Roller, 5 ton	0.4218	0.0	2.5	2.5	2.5	0.0	0.0	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Construction Equipment Total		**19.8**	**31.5**	**24.9**	**21.6**	**39.7**	**46.3**	**49.9**	**43.2**	**43.2**	**43.2**	**43.2**	**43.2**	**43.2**	**43.2**	**43.2**
Motor Vehicles																
Off-Site Vehicles																
Off-Site Dump Trucks	0.0104	0.0	1.2	1.2	1.2	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Off-Site Pipe Hauling Trucks	0.0104	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Construction Worker Commute	0.0087	75.4	75.4	75.4	75.4	113.0	113.0	113.0	113.0	113.0	113.0	113.0	113.0	113.0	113.0	113.0
Off-Site Motor Vehicle Total		**75.8**	**77.0**	**77.0**	**77.0**	**113.5**	**113.5**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**

Table 16-D
Natural Gas Pipeline Construction Daily Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Compressor, 250 cfm	0.0986	2.4	2.4	2.4	2.4	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Tractor/Loader/Backhoe	0.1000	0.9	1.8	0.0	0.0	1.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe	0.1403	0.0	1.3	1.3	0.0	0.0	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.1191	1.1	1.1	1.1	1.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Welder	0.1173	2.1	2.1	2.1	2.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Vibratory Compactor	0.1282	0.0	0.8	0.8	0.8	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Roller, 5 ton	0.1282	0.0	0.8	0.8	0.8	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Construction Equipment Total		**6.4**	**10.2**	**8.4**	**7.1**	**12.9**	**15.4**	**16.7**	**14.2**	**14.2**	**14.2**	**14.2**	**14.2**	**14.2**	**14.2**	**14.2**
Motor Vehicles																
Off-Site Vehicles																
Off-Site Dump Trucks	0.0025	0.0	0.3	0.3	0.3	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Off-Site Pipe Hauling Trucks	0.0025	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Construction Worker Commute	0.0008	6.9	6.9	6.9	6.9	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Off-Site Motor Vehicle Total		**7.0**	**7.3**	**7.3**	**7.3**	**10.5**	**10.5**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**

Table 16-E
Natural Gas Pipeline Construction Daily Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Compressor, 250 cfm	0.5945	14.3	14.3	14.3	14.3	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5
Tractor/Loader/Backhoe	0.6082	5.5	10.9	0.0	0.0	10.9	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe	0.3165	0.0	2.8	2.8	0.0	0.0	5.7	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.6897	6.2	6.2	6.2	6.2	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4
Welder	0.2691	4.8	4.8	4.8	4.8	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
Vibratory Compactor	0.7773	0.0	4.7	4.7	4.7	0.0	0.0	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
Roller, 5 ton	0.7773	0.0	4.7	4.7	4.7	0.0	0.0	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
Construction Equipment Total		**30.8**	**48.4**	**37.5**	**34.6**	**61.6**	**67.3**	**75.0**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**
Motor Vehicles																
Off-Site Vehicles																
Off-Site Dump Trucks	0.0370	0.0	4.4	4.4	4.4	0.0	0.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Off-Site Pipe Hauling Trucks	0.0370	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Off-Site Construction Worker Commute	0.0007	6.4	6.4	6.4	6.4	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6
Off-Site Motor Vehicle Total		**7.9**	**12.4**	**12.4**	**12.4**	**11.1**	**11.1**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**

Table 16-F
Natural Gas Pipeline Construction Daily Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Compressor, 250 cfm	0.00055	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tractor/Loader/Backhoe	0.00061	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe	0.00039	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.00059	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder	0.00034	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vibratory Compactor	0.00069	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.00069	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Motor Vehicles																
Off-Site Vehicles																
Off-Site Dump Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 16-G
Natural Gas Pipeline Construction Daily Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Compressor, 250 cfm	0.05268	1.3	1.3	1.3	1.3	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Tractor/Loader/Backhoe	0.05583	0.5	1.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe	0.03381	0.0	0.3	0.3	0.0	0.0	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.06359	0.6	0.6	0.6	0.6	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Welder	0.02796	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Vibratory Compactor	0.06738	0.0	0.4	0.4	0.4	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Roller, 5 ton	0.06738	0.0	0.4	0.4	0.4	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Construction Equipment Total		**2.8**	**4.5**	**3.5**	**3.1**	**5.7**	**6.3**	**6.9**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**
Motor Vehicles																
Off-Site Vehicles																
Off-Site Dump Trucks	0.00154	0.0	0.2	0.2	0.2	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Pipe Hauling Trucks	0.00154	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Construction Worker Commute	0.00003	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Motor Vehicle Total		**0.3**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**

Table 16-H
Natural Gas Pipeline Construction Daily Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Compressor, 250 cfm	0.04847	1.2	1.2	1.2	1.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Tractor/Loader/Backhoe	0.05137	0.5	0.9	0.0	0.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe	0.03110	0.0	0.3	0.3	0.0	0.0	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.05850	0.5	0.5	0.5	0.5	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Welder	0.02572	0.5	0.5	0.5	0.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Vibratory Compactor	0.06199	0.0	0.4	0.4	0.4	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Roller, 5 ton	0.06199	0.0	0.4	0.4	0.4	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Construction Equipment Total		**2.6**	**4.1**	**3.2**	**2.9**	**5.2**	**5.8**	**6.4**	**5.8**	**5.8**	**5.8**	**5.8**	**5.8**	**5.8**	**5.8**	**5.8**
Motor Vehicles																
Off-Site Vehicles																
Off-Site Dump Trucks	0.00142	0.0	0.2	0.2	0.2	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Off-Site Pipe Hauling Trucks	0.00142	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Construction Worker Commute	0.00003	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Off-Site Motor Vehicle Total		**0.3**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**

Table 16-I
Natural Gas Pipeline Construction Daily Motor Vehicle Fugitive PM10 Emissions

Vehicle Type	Emission Factor (lb/mile)	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Off-Site Vehicles																
Off-Site Dump Trucks	0.00100	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Off-Site Pipe Hauling Trucks	0.00100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	7.9	7.9	7.9	7.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
Off-Site Motor Vehicle Total		**8.0**	**8.1**	**8.1**	**8.1**	**11.9**	**11.9**	**12.1**	**12.1**	**12.1**	**12.1**	**12.1**	**12.1**	**12.1**	**12.1**	**12.1**

Table 16-J
Natural Gas Pipeline Construction Daily Motor Vehicle Fugitive PM2.5 Emissions

Vehicle Type	Emission Factor (lb/mile)	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Off-Site Vehicles																
Off-Site Dump Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	1.4	1.4	1.4	1.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Off-Site Motor Vehicle Total		**1.4**	**1.5**	**1.5**	**1.5**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**

Table 16-K
Natural Gas Pipeline Construction Daily Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Day														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	Cu. Yd.	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164
Storage Pile Wind Erosion[a]	Acres	9.48	9.48	9.48	9.48	9.48	9.48	9.48	9.48	9.48	9.48	9.48	9.48	9.48	9.48	9.48

[a] Total excavation is 5 ft. wide x 6 ft. deep x 9.2 mi. long, assumed to occur at a constant rate, during 22 working days per month.

[b] Based 5 ft. wide x 6 ft. tall x 9.2 mi. long and assuming 50 percent is stockpiled at any time.

Table 16-L
Natural Gas Pipeline Construction Daily Fugitive PM10 Emissions

Activity	Emission Factor	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	9.94E-04	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Storage Pile Wind Erosion	4.3	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7	40.7
Total		**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**	**40.8**

Table 16-M
Natural Gas Pipeline Construction Daily Fugitive PM2.5 Emissions

Activity	Emission Factor	Daily Emissions (lb/day)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Excavation	2.07E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.9	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Total		**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**	**8.5**

Table 17-A
Sewer Line Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number				
			Month 1	Month 2	Month 3	Month 4	Month 5
			1	**2**	**3**	**4**	**5**
Construction Equipment							
Compressor, 250 cfm	Diesel	8	2	2	2	2	2
Tractor/Loader/Backhoe	Diesel	3	2	2	2	2	2
Backhoe	Diesel	3	0	0	0	0	0
Crane, 5 ton	Diesel	3	2	2	2	2	2
Welder	Diesel	6	2	2	2	2	2
Vibratory Compactor	Diesel	2	0	0	0	0	0
Roller, 5 ton	Diesel	2	0	0	0	0	0
Motor Vehicles							
Off-Site Vehicles							
Off-Site Dump Trucks	Diesel	40	0	0	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	14	1	1	1	1	1
Off-Site Construction Worker Commute	Gasoline	60	72	72	72	72	72

Table 17-B
Sewer Line Construction Daily Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Daily Operating Hours or Miles				
		Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	Diesel	16	16	16	16	16
Tractor/Loader/Backhoe	Diesel	6	6	6	6	6
Backhoe	Diesel	0	0	0	0	0
Crane, 5 ton	Diesel	6	6	6	6	6
Welder	Diesel	12	12	12	12	12
Vibratory Compactor	Diesel	0	0	0	0	0
Roller, 5 ton	Diesel	0	0	0	0	0
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	Diesel	0	0	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	14	14	14	14	14
Off-Site Construction Worker Commute	Gasoline	4,320	4,320	4,320	4,320	4,320

Table 17-C
Sewer Line Construction Daily Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.3302	5.3	5.3	5.3	5.3	5.3
Tractor/Loader/Backhoe	0.3664	2.2	2.2	2.2	2.2	2.2
Backhoe	0.3694	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.3763	2.3	2.3	2.3	2.3	2.3
Welder	0.2908	3.5	3.5	3.5	3.5	3.5
Vibratory Compactor	0.4218	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.4218	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**13.2**	**13.2**	**13.2**	**13.2**	**13.2**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.0104	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0104	0.1	0.1	0.1	0.1	0.1
Off-Site Construction Worker Commute	0.0087	37.7	37.7	37.7	37.7	37.7
Off-Site Motor Vehicle Total		**37.8**	**37.8**	**37.8**	**37.8**	**37.8**

Table 17-D
Sewer Line Construction Daily Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.0986	1.6	1.6	1.6	1.6	1.6
Tractor/Loader/Backhoe	0.1000	0.6	0.6	0.6	0.6	0.6
Backhoe	0.1403	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.1191	0.7	0.7	0.7	0.7	0.7
Welder	0.1173	1.4	1.4	1.4	1.4	1.4
Vibratory Compactor	0.1282	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.1282	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**4.3**	**4.3**	**4.3**	**4.3**	**4.3**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.0025	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0025	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0008	3.5	3.5	3.5	3.5	3.5
Off-Site Motor Vehicle Total		**3.5**	**3.5**	**3.5**	**3.5**	**3.5**

Table 17-E
Sewer Line Construction Daily Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.5945	9.5	9.5	9.5	9.5	9.5
Tractor/Loader/Backhoe	0.6082	3.6	3.6	3.6	3.6	3.6
Backhoe	0.3165	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.6897	4.1	4.1	4.1	4.1	4.1
Welder	0.2691	3.2	3.2	3.2	3.2	3.2
Vibratory Compactor	0.7773	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.7773	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**20.5**	**20.5**	**20.5**	**20.5**	**20.5**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.0370	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0370	0.5	0.5	0.5	0.5	0.5
Off-Site Construction Worker Commute	0.0007	3.2	3.2	3.2	3.2	3.2
Off-Site Motor Vehicle Total		**3.7**	**3.7**	**3.7**	**3.7**	**3.7**

Table 17-F
Sewer Line Construction Daily Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.00055	0.0	0.0	0.0	0.0	0.0
Tractor/Loader/Backhoe	0.00061	0.0	0.0	0.0	0.0	0.0
Backhoe	0.00039	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.00059	0.0	0.0	0.0	0.0	0.0
Welder	0.00034	0.0	0.0	0.0	0.0	0.0
Vibratory Compactor	0.00069	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.00069	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.00007	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 17-G
Sewer Line Construction Daily Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.05268	0.8	0.8	0.8	0.8	0.8
Tractor/Loader/Backhoe	0.05583	0.3	0.3	0.3	0.3	0.3
Backhoe	0.03381	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.06359	0.4	0.4	0.4	0.4	0.4
Welder	0.02796	0.3	0.3	0.3	0.3	0.3
Vibratory Compactor	0.06738	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.06738	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**1.9**	**1.9**	**1.9**	**1.9**	**1.9**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.00154	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00154	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.1	0.1	0.1	0.1	0.1
Off-Site Motor Vehicle Total		**0.2**	**0.2**	**0.2**	**0.2**	**0.2**

Table 17-H
Sewer Line Construction Daily Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.04847	0.8	0.8	0.8	0.8	0.8
Tractor/Loader/Backhoe	0.05137	0.3	0.3	0.3	0.3	0.3
Backhoe	0.03110	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.05850	0.4	0.4	0.4	0.4	0.4
Welder	0.02572	0.3	0.3	0.3	0.3	0.3
Vibratory Compactor	0.06199	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.06199	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**1.7**	**1.7**	**1.7**	**1.7**	**1.7**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.00142	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00142	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.1	0.1	0.1	0.1	0.1
Off-Site Motor Vehicle Total		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**

Table 17-I
Sewer Line Construction Daily Motor Vehicle Fugitive PM10 Emissions

Vehicle Type	Emission Factor (lb/mile)	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Off-Site Vehicles						
Off-Site Dump Trucks	0.00100	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00100	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	4.0	4.0	4.0	4.0	4.0
Off-Site Motor Vehicle Total		**4.0**	**4.0**	**4.0**	**4.0**	**4.0**

Table 17-J
Sewer Line Construction Daily Motor Vehicle Fugitive PM2.5 Emissions

Vehicle Type	Emission Factor (lb/mile)	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Off-Site Vehicles						
Off-Site Dump Trucks	0.00019	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	0.7	0.7	0.7	0.7	0.7
Off-Site Motor Vehicle Total		**0.7**	**0.7**	**0.7**	**0.7**	**0.7**

Table 17-K
Sewer Line Construction Daily Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Day				
		Month 1	Month 2	Month 3	Month 4	Month 5
Excavation[a]	Cu. Yd.	60	60	60	60	60
Storage Pile Wind Erosion[b]	Acres	1.36	1.36	1.36	1.36	1.36

[a] Total excavation is 4 ft. wide x 6 ft. deep x 1.4 mi. long, assumed to occur at a constant rate, during 22 working days per month.

[b] Based 4 ft. wide x 6 ft. tall x 1.4 mi. long and assuming 50 percent is stockpiled at any time.

Table 17-L
Sewer Line Construction Daily Fugitive PM10 Emissions

Activity	Emission Factor	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Excavation	9.94E-04	0.1	0.1	0.1	0.1	0.1
Storage Pile Wind Erosion	4.3	5.8	5.8	5.8	5.8	5.8
Total		**5.9**	**5.9**	**5.9**	**5.9**	**5.9**

Table 17-M
Sewer Line Construction Daily Fugitive PM2.5 Emissions

Activity	Emission Factor	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Excavation	2.07E-04	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.9	1.2	1.2	1.2	1.2	1.2
Total		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**

Table 18-A
Potable Water Line Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number				
			Month 1	Month 2	Month 3	Month 4	Month 5
			1	2	3	4	5
Construction Equipment							
Compressor, 250 cfm	Diesel	8	2	2			
Tractor/Loader/Backhoe	Diesel	3	2	2			
Backhoe	Diesel	3	0	0			
Crane, 5 ton	Diesel	3	2	2			
Welder	Diesel	6	2	2			
Vibratory Compactor	Diesel	2	0	0			
Roller, 5 ton	Diesel	2	0	0			
Motor Vehicles							
Off-Site Vehicles							
Off-Site Dump Trucks	Diesel	40	0	0			
Off-Site Pipe Hauling Trucks	Diesel	14	1	1			
Off-Site Construction Worker Commute	Gasoline	60	72	72			

Table 18-B
Potable Water Line Construction Daily Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Daily Operating Hours or Miles				
		Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	Diesel	16	16	0	0	0
Tractor/Loader/Backhoe	Diesel	6	6	0	0	0
Backhoe	Diesel	0	0	0	0	0
Crane, 5 ton	Diesel	6	6	0	0	0
Welder	Diesel	12	12	0	0	0
Vibratory Compactor	Diesel	0	0	0	0	0
Roller, 5 ton	Diesel	0	0	0	0	0
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	Diesel	0	0	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	14	14	0	0	0
Off-Site Construction Worker Commute	Gasoline	4,320	4,320	0	0	0

Table 18-C
Potable Water Line Construction Daily Construction Equipment and Motor Vehicle CO Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.3302	5.3	5.3	0.0	0.0	0.0
Tractor/Loader/Backhoe	0.3664	2.2	2.2	0.0	0.0	0.0
Backhoe	0.3694	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.3763	2.3	2.3	0.0	0.0	0.0
Welder	0.2908	3.5	3.5	0.0	0.0	0.0
Vibratory Compactor	0.4218	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.4218	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**13.2**	**13.2**	**0.0**	**0.0**	**0.0**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.0104	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0104	0.1	0.1	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0087	37.7	37.7	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**37.8**	**37.8**	**0.0**	**0.0**	**0.0**

Table 18-D
Potable Water Line Construction Daily Construction Equipment and Motor Vehicle VOC Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.0986	1.6	1.6	0.0	0.0	0.0
Tractor/Loader/Backhoe	0.1000	0.6	0.6	0.0	0.0	0.0
Backhoe	0.1403	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.1191	0.7	0.7	0.0	0.0	0.0
Welder	0.1173	1.4	1.4	0.0	0.0	0.0
Vibratory Compactor	0.1282	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.1282	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**4.3**	**4.3**	**0.0**	**0.0**	**0.0**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.0025	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0025	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0008	3.5	3.5	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**3.5**	**3.5**	**0.0**	**0.0**	**0.0**

Table 18-E
Potable Water Line Construction Daily Construction Equipment and Motor Vehicle NOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.5945	9.5	9.5	0.0	0.0	0.0
Tractor/Loader/Backhoe	0.6082	3.6	3.6	0.0	0.0	0.0
Backhoe	0.3165	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.6897	4.1	4.1	0.0	0.0	0.0
Welder	0.2691	3.2	3.2	0.0	0.0	0.0
Vibratory Compactor	0.7773	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.7773	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**20.5**	**20.5**	**0.0**	**0.0**	**0.0**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.0370	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.0370	0.5	0.5	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0007	3.2	3.2	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**3.7**	**3.7**	**0.0**	**0.0**	**0.0**

Table 18-F
Potable Water Line Construction Daily Construction Equipment and Motor Vehicle SOx Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day) Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.00055	0.0	0.0	0.0	0.0	0.0
Tractor/Loader/Backhoe	0.00061	0.0	0.0	0.0	0.0	0.0
Backhoe	0.00039	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.00059	0.0	0.0	0.0	0.0	0.0
Welder	0.00034	0.0	0.0	0.0	0.0	0.0
Vibratory Compactor	0.00069	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.00069	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.00007	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00007	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00000	0.0	0.0	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 18-G
Potable Water Line Construction Daily Construction Equipment and Motor Vehicle Exhaust PM10 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.05268	0.8	0.8	0.0	0.0	0.0
Tractor/Loader/Backhoe	0.05583	0.3	0.3	0.0	0.0	0.0
Backhoe	0.03381	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.06359	0.4	0.4	0.0	0.0	0.0
Welder	0.02796	0.3	0.3	0.0	0.0	0.0
Vibratory Compactor	0.06738	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.06738	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**1.9**	**1.9**	**0.0**	**0.0**	**0.0**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.00154	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00154	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.1	0.1	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**0.2**	**0.2**	**0.0**	**0.0**	**0.0**

Table 18-H
Potable Water Line Construction Daily Construction Equipment and Motor Vehicle Exhaust PM2.5 Emissions

Equipment/Vehicle Type	Emission Factor (lb/hr or lb/mile)	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment						
Compressor, 250 cfm	0.04847	0.8	0.8	0.0	0.0	0.0
Tractor/Loader/Backhoe	0.05137	0.3	0.3	0.0	0.0	0.0
Backhoe	0.03110	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	0.05850	0.4	0.4	0.0	0.0	0.0
Welder	0.02572	0.3	0.3	0.0	0.0	0.0
Vibratory Compactor	0.06199	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	0.06199	0.0	0.0	0.0	0.0	0.0
Construction Equipment Total		**1.7**	**1.7**	**0.0**	**0.0**	**0.0**
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.00142	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00142	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00003	0.1	0.1	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**0.1**	**0.1**	**0.0**	**0.0**	**0.0**

Table 18-I
Potable Water Line Construction Daily Motor Vehicle Fugitive PM10 Emissions

Vehicle Type	Emission Factor (lb/mile)	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Off-Site Vehicles						
Off-Site Dump Trucks	0.00100	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00100	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00092	4.0	4.0	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**4.0**	**4.0**	**0.0**	**0.0**	**0.0**

Table 18-J
Potable Water Line Construction Daily Motor Vehicle Fugitive PM2.5 Emissions

Vehicle Type	Emission Factor (lb/mile)	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Off-Site Vehicles						
Off-Site Dump Trucks	0.00019	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.00019	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.00017	0.7	0.7	0.0	0.0	0.0
Off-Site Motor Vehicle Total		**0.7**	**0.7**	**0.0**	**0.0**	**0.0**

Table 18-K
Potable Water Line Construction Daily Fugitive PM10 and PM2.5 Activities

Activity	Units	Quantity per Day				
		Month 1	Month 2	Month 3	Month 4	Month 5
Excavation[a]	Cu. Yd.	60	60	60	60	60
Storage Pile Wind Erosion[b]	Acres	1.36	1.36	1.36	1.36	1.36

[a] Total excavation is 4 ft. wide x 6 ft. deep x 1.4 mi. long, assumed to occur at a constant rate, during 22 working days per month.

[b] Based 4 ft. wide x 6 ft. tall x 1.4 mi. long and assuming 50 percent is stockpiled at any time.

Table 18-L
Potable Water Line Construction Daily Fugitive PM10 Emissions

Activity	Emission Factor	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Excavation	9.94E-04	0.1	0.1	0.1	0.1	0.1
Storage Pile Wind Erosion	4.3	5.8	5.8	5.8	5.8	5.8
Total		**5.9**	**5.9**	**5.9**	**5.9**	**5.9**

Table 18-M
Potable Water Line Construction Daily Fugitive PM2.5 Emissions

Activity	Emission Factor	Daily Emissions (lb/day)				
		Month 1	Month 2	Month 3	Month 4	Month 5
Excavation	2.07E-04	0.0	0.0	0.0	0.0	0.0
Storage Pile Wind Erosion	0.9	1.2	1.2	1.2	1.2	1.2
Total		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**

Table 19-A
Reclaimed Water Pipeline Construction Daily CO Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
On-Site									
Equipment	19.8	31.5	24.9	21.6	39.7	46.3	49.9	43.2	43.2
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**19.8**	**31.5**	**24.9**	**21.6**	**39.7**	**46.3**	**49.9**	**43.2**	**43.2**
Off-Site Motor Vehicles	**75.8**	**77.0**	**77.0**	**77.0**	**113.5**	**113.5**	**114.7**	**114.7**	**114.7**
Monthly Total	**95.6**	**108.6**	**102.0**	**98.6**	**153.1**	**159.8**	**164.6**	**157.9**	**157.9**
Maximum Daily Total (lb/day)	**164.6**								

Table 19-B
Reclaimed Water Pipeline Construction Daily VOC Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
On-Site									
Equipment	6.4	10.2	8.4	7.1	12.9	15.4	16.7	14.2	14.2
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**6.4**	**10.2**	**8.4**	**7.1**	**12.9**	**15.4**	**16.7**	**14.2**	**14.2**
Off-Site Motor Vehicles	**7.0**	**7.3**	**7.3**	**7.3**	**10.5**	**10.5**	**10.8**	**10.8**	**10.8**
Monthly Total	**13.5**	**17.5**	**15.7**	**14.4**	**23.4**	**25.9**	**27.5**	**25.0**	**25.0**
Maximum Daily Total (lb/day)	**27.5**								

Table 19-C
Reclaimed Water Pipeline Construction Daily NOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
On-Site									
Equipment	30.8	48.4	37.5	34.6	61.6	67.3	75.0	69.3	69.3
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**30.8**	**48.4**	**37.5**	**34.6**	**61.6**	**67.3**	**75.0**	**69.3**	**69.3**
Off-Site Motor Vehicles	**7.9**	**12.4**	**12.4**	**12.4**	**11.1**	**11.1**	**15.6**	**15.6**	**15.6**
Monthly Total	**38.7**	**60.8**	**49.9**	**47.0**	**72.7**	**78.4**	**90.6**	**84.9**	**84.9**
Maximum Daily Total (lb/day)	**90.6**								

Table 19-D
Reclaimed Water Pipeline Construction Daily SOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
On-Site									
Equipment	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Total	**0.0**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Maximum Daily Total (lb/day)	**0.1**								

Table 19-E
Reclaimed Water Pipeline Construction Daily PM10 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
On-Site									
Equipment	2.8	4.5	3.5	3.1	5.7	6.3	6.9	6.3	6.3
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6
On-Site Total	**35.5**	**37.1**	**36.1**	**35.8**	**38.3**	**38.9**	**39.6**	**38.9**	**38.9**
Off-Site Motor Vehicle Exhaust and Fugitive	**8.3**	**8.6**	**8.6**	**8.6**	**12.4**	**12.4**	**12.7**	**12.7**	**12.7**
Monthly Total	**43.8**	**45.7**	**44.7**	**44.4**	**50.7**	**51.3**	**52.3**	**51.7**	**51.7**
Maximum Daily Total (lb/day)	**52.3**								

Table 19-F
Reclaimed Water Pipeline Construction Daily PM2.5 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
On-Site									
Equipment	2.6	4.1	3.2	2.9	5.2	5.8	6.4	5.8	5.8
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
On-Site Total	**9.4**	**10.9**	**10.0**	**9.7**	**12.0**	**12.6**	**13.1**	**12.6**	**12.6**
Off-Site Motor Vehicle Exhaust and Fugitive	**1.7**	**1.9**	**1.9**	**1.9**	**2.6**	**2.6**	**2.8**	**2.8**	**2.8**
Monthly Total	**11.2**	**12.8**	**11.9**	**11.6**	**14.6**	**15.2**	**15.9**	**15.4**	**15.4**
Maximum Daily Total (lb/day)	**15.9**								

Table 20-A
Natural Gas Pipeline Construction Daily CO Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-Site															
Equipment	19.8	31.5	24.9	21.6	39.7	46.3	49.9	43.2	43.2	43.2	43.2	43.2	43.2	43.2	43.2
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**19.8**	**31.5**	**24.9**	**21.6**	**39.7**	**46.3**	**49.9**	**43.2**	**43.2**	**43.2**	**43.2**	**43.2**	**43.2**	**43.2**	**43.2**
Off-Site Motor Vehicles	**75.8**	**77.0**	**77.0**	**77.0**	**113.5**	**113.5**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**	**114.7**
Monthly Total	**95.6**	**108.6**	**102.0**	**98.6**	**153.1**	**159.8**	**164.6**	**157.9**	**157.9**	**157.9**	**157.9**	**157.9**	**157.9**	**157.9**	**157.9**
Maximum Daily Total (lb/day)	**164.6**														

Table 20-B
Natural Gas Pipeline Construction Daily VOC Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-Site															
Equipment	6.4	10.2	8.4	7.1	12.9	15.4	16.7	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**6.4**	**10.2**	**8.4**	**7.1**	**12.9**	**15.4**	**16.7**	**14.2**	**14.2**	**14.2**	**14.2**	**14.2**	**14.2**	**14.2**	**14.2**
Off-Site Motor Vehicles	**7.0**	**7.3**	**7.3**	**7.3**	**10.5**	**10.5**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**	**10.8**
Monthly Total	**13.5**	**17.5**	**15.7**	**14.4**	**23.4**	**25.9**	**27.5**	**25.0**	**25.0**	**25.0**	**25.0**	**25.0**	**25.0**	**25.0**	**25.0**
Maximum Daily Total (lb/day)	**27.5**														

Table 20-C
Natural Gas Pipeline Construction Daily NOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-Site															
Equipment	30.8	48.4	37.5	34.6	61.6	67.3	75.0	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**30.8**	**48.4**	**37.5**	**34.6**	**61.6**	**67.3**	**75.0**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**
Off-Site Motor Vehicles	**7.9**	**12.4**	**12.4**	**12.4**	**11.1**	**11.1**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**	**15.6**
Monthly Total	**38.7**	**60.8**	**49.9**	**47.0**	**72.7**	**78.4**	**90.6**	**84.9**	**84.9**	**84.9**	**84.9**	**84.9**	**84.9**	**84.9**	**84.9**
Maximum Daily Total (lb/day)	**90.6**														

Table 20-D
Natural Gas Pipeline Construction Daily SOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-Site															
Equipment	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Motor Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Total	**0.0**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Maximum Daily Total (lb/day)	**0.1**														

Table 20-E
Natural Gas Pipeline Construction Daily PM10 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-Site															
Equipment	2.8	4.5	3.5	3.1	5.7	6.3	6.9	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8
On-Site Total	**43.7**	**45.3**	**44.3**	**44.0**	**46.5**	**47.1**	**47.8**	**47.1**	**47.1**	**47.1**	**47.1**	**47.1**	**47.1**	**47.1**	**47.1**
Off-Site Motor Vehicle Exhaust and Fugitive	**8.3**	**8.6**	**8.6**	**8.6**	**12.4**	**12.4**	**12.7**	**12.7**	**12.7**	**12.7**	**12.7**	**12.7**	**12.7**	**12.7**	**12.7**
Monthly Total	**52.0**	**53.9**	**52.9**	**52.6**	**58.9**	**59.5**	**60.5**	**59.8**	**59.8**	**59.8**	**59.8**	**59.8**	**59.8**	**59.8**	**59.8**
Maximum Daily Total (lb/day)	**60.5**														

Table 20-F
Natural Gas Pipeline Construction Daily PM2.5 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
On-Site															
Equipment	2.6	4.1	3.2	2.9	5.2	5.8	6.4	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Motor Vehicle Exhaust	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
On-Site Total	**11.1**	**12.6**	**11.7**	**11.4**	**13.7**	**14.3**	**14.8**	**14.3**	**14.3**	**14.3**	**14.3**	**14.3**	**14.3**	**14.3**	**14.3**
Off-Site Motor Vehicle Exhaust and Fugitive	**1.7**	**1.9**	**1.9**	**1.9**	**2.6**	**2.6**	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**
Monthly Total	**12.9**	**14.5**	**13.6**	**13.3**	**16.3**	**16.9**	**17.6**	**17.1**	**17.1**	**17.1**	**17.1**	**17.1**	**17.1**	**17.1**	**17.1**
Maximum Daily Total (lb/day)	**17.6**														

Table 21-A
Sewer Line Construction Daily CO Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	13.2	13.2	13.2	13.2	13.2
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
On-Site Total	**13.2**	**13.2**	**13.2**	**13.2**	**13.2**
Off-Site Motor Vehicles	**37.8**	**37.8**	**37.8**	**37.8**	**37.8**
Monthly Total	**51.0**	**51.0**	**51.0**	**51.0**	**51.0**
Maximum Daily Total (lb/day)	**51.0**				

Table 21-B
Sewer Line Construction Daily VOC Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	4.3	4.3	4.3	4.3	4.3
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
On-Site Total	**4.3**	**4.3**	**4.3**	**4.3**	**4.3**
Off-Site Motor Vehicles	**3.5**	**3.5**	**3.5**	**3.5**	**3.5**
Monthly Total	**7.8**	**7.8**	**7.8**	**7.8**	**7.8**
Maximum Daily Total (lb/day)	**7.8**				

Table 21-C
Sewer Line Construction Daily NOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	20.5	20.5	20.5	20.5	20.5
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
On-Site Total	**20.5**	**20.5**	**20.5**	**20.5**	**20.5**
Off-Site Motor Vehicles	**3.7**	**3.7**	**3.7**	**3.7**	**3.7**
Monthly Total	**24.2**	**24.2**	**24.2**	**24.2**	**24.2**
Maximum Daily Total (lb/day)	**24.2**				

Table 21-D
Sewer Line Construction Daily SOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Maximum Daily Total (lb/day)	**0.0**				

Table 21-E
Sewer Line Construction Daily PM10 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	1.9	1.9	1.9	1.9	1.9
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
Fugitive	5.9	5.9	5.9	5.9	5.9
On-Site Total	**7.8**	**7.8**	**7.8**	**7.8**	**7.8**
Off-Site Motor Vehicle Exhaust and Fugitive	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**
Monthly Total	**11.9**	**11.9**	**11.9**	**11.9**	**11.9**
Maximum Daily Total (lb/day)	**11.9**				

Table 21-F
Sewer Line Construction Daily PM2.5 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	1.7	1.7	1.7	1.7	1.7
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
Fugitive	1.2	1.2	1.2	1.2	1.2
On-Site Total	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**
Monthly Total	**3.8**	**3.8**	**3.8**	**3.8**	**3.8**
Maximum Daily Total (lb/day)	**3.8**				

Table 22-A
Potable Water Line Construction Daily CO Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	13.2	13.2	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
On-Site Total	**13.2**	**13.2**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**37.8**	**37.8**	**0.0**	**0.0**	**0.0**
Monthly Total	**51.0**	**51.0**	**0.0**	**0.0**	**0.0**
Maximum Daily Total (lb/day)	**51.0**				

Table 22-B
Potable Water Line Construction Daily VOC Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	4.3	4.3	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
On-Site Total	**4.3**	**4.3**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**3.5**	**3.5**	**0.0**	**0.0**	**0.0**
Monthly Total	**7.8**	**7.8**	**0.0**	**0.0**	**0.0**
Maximum Daily Total (lb/day)	**7.8**				

Table 22-C
Potable Water Line Construction Daily NOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	20.5	20.5	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
On-Site Total	**20.5**	**20.5**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**3.7**	**3.7**	**0.0**	**0.0**	**0.0**
Monthly Total	**24.2**	**24.2**	**0.0**	**0.0**	**0.0**
Maximum Daily Total (lb/day)	**24.2**				

Table 22-D
Potable Water Line Construction Daily SOx Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	0.0	0.0	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
On-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Off-Site Motor Vehicles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Maximum Daily Total (lb/day)	**0.0**				

Table 22-E
Potable Water Line Construction Daily PM10 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	1.9	1.9	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
Fugitive	5.9	5.9	5.9	5.9	5.9
On-Site Total	**7.8**	**7.8**	**5.9**	**5.9**	**5.9**
Off-Site Motor Vehicle Exhaust and Fugitive	**4.1**	**4.1**	**0.0**	**0.0**	**0.0**
Monthly Total	**11.9**	**11.9**	**5.9**	**5.9**	**5.9**
Maximum Daily Total (lb/day)	**11.9**				

Table 22-F
Potable Water Line Construction Daily PM2.5 Emissions Summary

	Month 1	Month 2	Month 3	Month 4	Month 5
On-Site					
Equipment	1.7	1.7	0.0	0.0	0.0
Motor Vehicles	0.0	0.0	0.0	0.0	0.0
Fugitive	1.2	1.2	1.2	1.2	1.2
On-Site Total	**3.0**	**3.0**	**1.2**	**1.2**	**1.2**
Off-Site Motor Vehicle Exhaust and Fugitive	**0.9**	**0.9**	**0.0**	**0.0**	**0.0**
Monthly Total	**3.8**	**3.8**	**1.2**	**1.2**	**1.2**
Maximum Daily Total (lb/day)	**3.8**				

Table 23-A
Transmission Line Segment 1 Construction Equipment Emissions

					Emission Factors (lb/hr)						Emissions (lb/day)					
Phase	**Equipment Type**	**Fuel**	**Hours/Day**	**Number**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**
Construction Equipment																
Marshalling Yards	Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	4	1	0.4902	0.1281	0.9859	0.0009	0.0566	0.0521	2.0	0.5	3.9	0.0	0.2	0.2
	Loader, Front End, w/ Bucket	Diesel	1	1	0.6348	0.1573	1.2278	0.0012	0.0702	0.0646	0.6	0.2	1.2	0.0	0.1	0.1
	Forklift, 5 Ton	Diesel	3	1	1.0875	0.3460	3.5414	0.0039	0.1269	0.1168	3.3	1.0	10.6	0.0	0.4	0.4
	Forklift, 10 Ton	Diesel	3	1	1.0875	0.3460	3.5414	0.0039	0.1269	0.1168	3.3	1.0	10.6	0.0	0.4	0.4
Marshalling Yards Total											**9.1**	**2.7**	**26.4**	**0.0**	**1.1**	**1.0**
Road Work	Crawler, Track Type, w/ Blade (D8 type)	Diesel	8	1	1.2793	0.3022	2.8640	0.0025	0.1150	0.1058	10.2	2.4	22.9	0.0	0.9	0.8
	Motor Grader	Diesel	8	1	0.5520	0.1672	0.9824	0.0009	0.0904	0.0832	4.4	1.3	7.9	0.0	0.7	0.7
Road Work Total											**14.7**	**3.8**	**30.8**	**0.0**	**1.6**	**1.5**
Foundations	Drill Rig, Truck Mount	Diesel	8.5	2	0.3476	0.1002	1.3151	0.0021	0.0396	0.0364	5.9	1.7	22.4	0.0	0.7	0.6
	Truck, Flatbed w/Boom, 5 Ton	Diesel	6	2	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	4.4	1.6	15.7	0.0	0.6	0.6
	Crawler, Track Type, Drill Rig, Pneumatic	Diesel	2	1	1.2793	0.3022	2.8640	0.0025	0.1150	0.1058	2.6	0.6	5.7	0.0	0.2	0.2
	Concrete Pumper	Diesel	8.5	2	0.5475	0.1448	0.9250	0.0009	0.0794	0.0730	9.3	2.5	15.7	0.0	1.3	1.2
	Loader, Front End, w/ Bucket	Diesel	3.5	1	0.6348	0.1573	1.2278	0.0012	0.0702	0.0646	2.2	0.6	4.3	0.0	0.2	0.2
	Generator	Gasoline	8.5	2	1.5828	0.1232	0.0217	0.0001	0.0087	0.0066	26.9	2.1	0.4	0.0	0.1	0.1
Foundations Total											**51.3**	**9.0**	**64.2**	**0.1**	**3.2**	**3.0**
Steel	Crane, Hydraulic, 150 Ton	Diesel	9	2	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	6.6	2.4	23.6	0.0	0.9	0.8
	Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	9	3	0.4902	0.1281	0.9859	0.0009	0.0566	0.0521	13.2	3.5	26.6	0.0	1.5	1.4
	Truck, Flatbed w/Boom, 5 Ton	Diesel	9	2	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	6.6	2.4	23.6	0.0	0.9	0.8
	Crawler, Track Type, w/ Blade (D6 type)	Diesel	6	1	0.7652	0.2048	1.5628	0.0014	0.0900	0.0828	4.6	1.2	9.4	0.0	0.5	0.5
Steel Total											**30.9**	**9.4**	**83.2**	**0.1**	**3.9**	**3.6**
Conductor	Truck, Flatbed w/Boom, 5 Ton	Diesel	10	3	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	10.9	3.9	39.3	0.0	1.5	1.4
	Tension Machine	Diesel	2.5	1	0.5910	0.1265	1.0686	0.0012	0.0576	0.0530	1.5	0.3	2.7	0.0	0.1	0.1
	Truck, Wire Puller, 3 Drum	Diesel	2.5	1	0.6496	0.1811	2.1214	0.0025	0.0719	0.0661	1.6	0.5	5.3	0.0	0.2	0.2
	Truck, Wire Puller, 1 Drum (OVHD Gr. Wr.)	Diesel	2.5	1	0.6496	0.1811	2.1214	0.0025	0.0719	0.0661	1.6	0.5	5.3	0.0	0.2	0.2
	Crawler, Track Type, w/ Blade (D8 type)	Diesel	2.5	1	1.2793	0.3022	2.8640	0.0025	0.1150	0.1058	3.2	0.8	7.2	0.0	0.3	0.3
	Crawler, Track Type, Sagging (D8 type)	Diesel	4	1	1.2793	0.3022	2.8640	0.0025	0.1150	0.1058	5.1	1.2	11.5	0.0	0.5	0.4
	Backhoe, w/Bucket	Diesel	3.5	1	0.3664	0.1000	0.6082	0.0006	0.0558	0.0514	1.3	0.3	2.1	0.0	0.2	0.2
	Digger, Transmission Type, Truck Mount	Diesel	1	1	0.8496	0.2900	2.8069	0.0025	0.1154	0.1062	0.8	0.3	2.8	0.0	0.1	0.1
	Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	10	3	0.4902	0.1281	0.9859	0.0009	0.0566	0.0521	14.7	3.8	29.6	0.0	1.7	1.6
	Generator	Gasoline	10	3	1.5828	0.1232	0.0217	0.0001	0.0087	0.0066	47.5	3.7	0.7	0.0	0.3	0.2
Conductor Total											**88.3**	**15.3**	**106.4**	**0.1**	**5.0**	**4.6**
Cleanup	Truck, Flatbed w/Boom, 5 Ton	Diesel	8	1	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	2.9	1.0	10.5	0.0	0.4	0.4
	Crawler, Track Type, w/ Blade (D6 type)	Diesel	10	1	0.7652	0.2048	1.5628	0.0014	0.0900	0.0828	7.7	2.0	15.6	0.0	0.9	0.8
	Motor Grader	Diesel	10	1	0.5520	0.1672	0.9824	0.0009	0.0904	0.0832	5.5	1.7	9.8	0.0	0.9	0.8
Cleanup Total											**16.1**	**4.8**	**35.9**	**0.0**	**2.2**	**2.0**

Note: Totals may not match sum of individual values because of rounding.

Table 23-B
Transmission Line Segment 1 Construction Motor Vehicle Exhaust Emissions

					Emission Factors (lb/hr)						Emissions (lb/day)					
Phase	**Vehicle Type**	**Fuel**	**Miles/Day**	**Number**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**
On-site Vehicles																
Marshalling Yards	On-Site Semi Tractor	Diesel	5	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.2	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	5	2	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.1	0.0	0.0	0.0	0.0	0.0
	On-Site Flatbed Truck	Diesel	5	1	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.3	0.0	0.1	0.0	0.0	0.0
Marshalling Yards Total											**0.5**	**0.0**	**0.2**	**0.0**	**0.0**	**0.0**
Road Work	On-Site Semi Tractor	Diesel	6	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	6	1	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.1	0.0	0.0	0.0	0.0	0.0
Road Work Total											**0.2**	**0.0**	**0.4**	**0.0**	**0.0**	**0.0**
Foundations	On-Site Flatbed Truck, 2 Ton	Gasoline	3	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.4	0.0	0.1	0.0	0.0	0.0
	On-Site Cement Trucks	Diesel	3	4	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Semi Tractor	Diesel	3	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.2	0.0	0.0	0.0
	On-Site Dump Truck	Diesel	3	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.2	0.0	0.0	0.0
	On-Site Watering Truck	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
	On-Site Mechanics Truck	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	3	2	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.1	0.0	0.0	0.0	0.0	0.0
	On-Site Flatbed Truck	Gasoline	3	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.4	0.0	0.1	0.0	0.0	0.0
Foundations Total											**1.2**	**0.1**	**1.2**	**0.0**	**0.0**	**0.0**
Steel	On-Site Flatbed Truck, 2 Ton	Gasoline	3	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.4	0.0	0.1	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	3	4	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.1	0.0	0.0	0.0	0.0	0.0
	On-Site Flatbed Truck	Gasoline	3	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.4	0.0	0.1	0.0	0.0	0.0
	On-Site Semi Tractor	Diesel	3	4	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Watering Truck	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
	On-Site Mechanics Truck	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
Steel Total											**1.1**	**0.1**	**0.8**	**0.0**	**0.0**	**0.0**
Conductor	On-Site Semi Tractor	Diesel	3	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.2	0.0	0.0	0.0
	On-Site Watering Truck	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
	On-Site Flatbed Truck	Gasoline	3	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.4	0.0	0.1	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	3	3	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.1	0.0	0.0	0.0	0.0	0.0
	On-Site Mechanics Truck	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
Conductor Total											**0.6**	**0.1**	**0.5**	**0.0**	**0.0**	**0.0**
Cleanup	On-Site Dump Truck	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
	On-Site Semi Tractor	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
	On-Site Flatbed Truck	Gasoline	3	1	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.2	0.0	0.0	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	3	1	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup Total											**1.5**	**0.2**	**1.3**	**0.0**	**0.0**	**0.0**
Off-Site Vehicles																
Marshalling Yards	Off-Site Construction Worker Commute	Gasoline	60	6	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	3.1	0.3	0.3	0.0	0.0	0.0
Road Work	Off-Site Construction Worker Commute	Gasoline	60	3	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	1.6	0.1	0.1	0.0	0.0	0.0
Foundations	Off-Site Construction Worker Commute	Gasoline	60	20	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	10.5	1.0	0.9	0.0	0.0	0.0
Steel	Off-Site Construction Worker Commute	Gasoline	60	28	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	14.7	1.3	1.2	0.0	0.1	0.0
Conductor	Off-Site Construction Worker Commute	Gasoline	60	15	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	7.8	0.7	0.7	0.0	0.0	0.0
Cleanup	Off-Site Construction Worker Commute	Gasoline	60	4	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	2.1	0.2	0.2	0.0	0.0	0.0

Note: Totals may not match sum of individual values because of rounding.

Table 23-C
Transmission Line Segment 1 Construction Motor Vehicle Fugitive PM10 and PM2.5 Emissions

Phase	Vehicle Type	Miles/Day	Number	Emission Factors (lb/mi) PM10	Emission Factors (lb/mi) PM2.5	Emissions (lb/day) PM10	Emissions (lb/day) PM2.5
On-site Vehicles							
Marshalling Yards	On-Site Semi Tractor	5	1	1.0424	0.2210	5.2	1.1
	On-Site Pickup Truck	5	2	1.0424	0.2210	10.4	2.2
	On-Site Flatbed Truck	5	1	1.0423	0.2210	5.2	1.1
Marshalling Yards Total						**20.8**	**4.4**
Road Work	On-Site Semi Tractor	6	2	1.0424	0.2210	12.5	2.7
	On-Site Pickup Truck	6	1	1.0424	0.2210	6.3	1.3
Road Work Total						**18.8**	**4.0**
Foundations	On-Site Flatbed Truck, 2 Ton	3	2	1.0423	0.2210	6.3	1.3
	On-Site Cement Trucks	3	4	1.0424	0.2210	12.5	2.7
	On-Site Semi Tractor	3	2	1.0424	0.2210	6.3	1.3
	On-Site Dump Truck	3	2	1.0424	0.2210	6.3	1.3
	On-Site Watering Truck	3	1	0.0001	0.0000	0.0	0.0
	On-Site Mechanics Truck	3	1	1.0424	0.2210	3.1	0.7
	On-Site Pickup Truck	3	2	1.0424	0.2210	6.3	1.3
	On-Site Flatbed Truck	3	2	1.0423	0.2210	6.3	1.3
Foundations Total						**46.9**	**9.9**
Steel	On-Site Flatbed Truck, 2 Ton	3	2	1.0423	0.2210	6.3	1.3
	On-Site Pickup Truck	3	4	1.0424	0.2210	12.5	2.7
	On-Site Flatbed Truck	3	2	1.0423	0.2210	6.3	1.3
	On-Site Semi Tractor	3	4	1.0424	0.2210	12.5	2.7
	On-Site Watering Truck	3	1	0.0001	0.0000	0.0	0.0
	On-Site Mechanics Truck	3	1	1.0424	0.2210	3.1	0.7
Steel Total						**40.7**	**8.6**
Conductor	On-Site Semi Tractor	3	2	1.0424	0.2210	6.3	1.3
	On-Site Watering Truck	3	1	0.0001	0.0000	0.0	0.0
	On-Site Flatbed Truck	3	2	1.0423	0.2210	6.3	1.3
	On-Site Pickup Truck	3	3	1.0424	0.2210	9.4	2.0
	On-Site Mechanics Truck	3	1	1.0424	0.2210	3.1	0.7
Conductor Total						**25.0**	**5.3**
Cleanup	On-Site Dump Truck	3	1	1.0424	0.2210	3.1	0.7
	On-Site Semi Tractor	3	1	1.0424	0.2210	3.1	0.7
	On-Site Flatbed Truck	3	1	1.0423	0.2210	3.1	0.7
	On-Site Pickup Truck	3	1	1.0424	0.2210	3.1	0.7
Cleanup Total						**12.5**	**2.7**
Off-Site Vehicles							
Marshalling Yards	Off-Site Construction Worker Commute	60	6	0.0009	0.0002	0.3	0.1
Road Work	Off-Site Construction Worker Commute	60	3	0.0009	0.0002	0.2	0.0
Foundations	Off-Site Construction Worker Commute	60	20	0.0009	0.0002	1.1	0.2
Steel	Off-Site Construction Worker Commute	60	28	0.0009	0.0002	1.5	0.3
Conductor	Off-Site Construction Worker Commute	60	15	0.0009	0.0002	0.8	0.1
Cleanup	Off-Site Construction Worker Commute	60	4	0.0009	0.0002	0.2	0.0

Note: Totals may not match sum of individual values because of rounding.

Table 23-D
Transmission Line Segment 1 Construction Daily Fugitive PM10 and PM2.5 Emissions

Phase	Activity	Units	Quantity/ Day	Emission Factors		Emissions (lb/day)	
				PM10	PM2.5	PM10	PM2.5
Marshalling Yards	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	0.0	0.617	0.128	0.0	0.0
Marshalling Yards Total						**0.0**	**0.0**
Road Work	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	16.0	0.617	0.128	9.9	2.1
Road Work Total						**9.9**	**2.1**
Foundations	Excavation	Cu. Yd.	237	9.94E-04	2.07E-04	0.2	0.0
	Storage Pile Wind Erosion	Acres-Days	0.02	4.29	0.89	0.1	0.0
	Bulldozing and Grading	Hours	0.0	0.617	0.128	0.0	0.0
Foundations Total						**0.3**	**0.1**
Steel	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	6.0	0.617	0.128	3.7	0.8
Steel Total						**3.7**	**0.8**
Conductor	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	2.5	0.617	0.128	1.5	0.3
Conductor Total						**1.5**	**0.3**
Cleanup	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	20.0	0.617	0.128	12.3	2.6
Cleanup Total						**12.3**	**2.6**

Note: Totals may not match sum of individual values because of rounding.

Table 24-A
Transmission Line Segment 2 Construction Equipment Emissions

					Emission Factors (lb/hr)						Emissions (lb/day)					
Phase	**Equipment Type**	**Fuel**	**Hours/Day**	**Number**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**
Construction Equipment																
Marshalling Yards	Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	5	1	0.4902	0.1281	0.9859	0.0009	0.0566	0.0521	2.5	0.6	4.9	0.0	0.3	0.3
	Loader, Front End, w/ Bucket	Diesel	1	1	0.6348	0.1573	1.2278	0.0012	0.0702	0.0646	0.6	0.2	1.2	0.0	0.1	0.1
	Forklift, 5 Ton	Diesel	7	1	1.0875	0.3460	3.5414	0.0039	0.1269	0.1168	7.6	2.4	24.8	0.0	0.9	0.8
	Forklift, 10 Ton	Diesel	5	1	1.0875	0.3460	3.5414	0.0039	0.1269	0.1168	5.4	1.7	17.7	0.0	0.6	0.6
	Truck, Flatbed w/Boom, 5 Ton	Diesel	7	2	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	5.1	1.8	18.4	0.0	0.7	0.6
Marshalling Yards Total											**21.2**	**6.8**	**67.0**	**0.1**	**2.6**	**2.4**
Road Work	Crawler, Track Type, w/ Blade (D8 type)	Diesel	8	1	1.2793	0.3022	2.8640	0.0025	0.1150	0.1058	10.2	2.4	22.9	0.0	0.9	0.8
	Motor Grader	Diesel	1	1	0.5520	0.1672	0.9824	0.0009	0.0904	0.0832	0.6	0.2	1.0	0.0	0.1	0.1
Road Work Total											**10.8**	**2.6**	**23.9**	**0.0**	**1.0**	**0.9**
Tower and Substation Foundation	Drill Rig, Truck Mount	Diesel	7.5	3	0.3476	0.1002	1.3151	0.0021	0.0396	0.0364	7.8	2.3	29.6	0.0	0.9	0.8
	Truck, Flatbed w/Boom, 5 Ton	Diesel	5	2	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	3.6	1.3	13.1	0.0	0.5	0.5
	Crawler, Track Type, Drill Rig, Pneumatic	Diesel	2	1	1.2793	0.3022	2.8640	0.0025	0.1150	0.1058	2.6	0.6	5.7	0.0	0.2	0.2
	Loader, Front End, w/ Bucket	Diesel	3.5	1	0.6348	0.1573	1.2278	0.0012	0.0702	0.0646	2.2	0.6	4.3	0.0	0.2	0.2
	Generator	Gasoline	7.5	4	1.5828	0.1232	0.0217	0.0001	0.0087	0.0066	47.5	3.7	0.7	0.0	0.3	0.2
Tower and Substation Foundation Total											**63.7**	**8.4**	**53.4**	**0.1**	**2.1**	**1.9**
Steel	Crane, Hydraulic, 150 Ton	Diesel	9	2	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	6.6	2.4	23.6	0.0	0.9	0.8
	Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	9	3	0.4902	0.1281	0.9859	0.0009	0.0566	0.0521	13.2	3.5	26.6	0.0	1.5	1.4
	Truck, Flatbed w/Boom, 5 Ton	Diesel	9	2	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	6.6	2.4	23.6	0.0	0.9	0.8
	Crawler, Track Type, w/ Blade (D6 type)	Diesel	6	1	0.7652	0.2048	1.5628	0.0014	0.0900	0.0828	4.6	1.2	9.4	0.0	0.5	0.5
Steel Total											**30.9**	**9.4**	**83.2**	**0.1**	**3.9**	**3.6**
Conductor	Truck, Flatbed w/Boom, 5 Ton	Diesel	9	3	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	9.8	3.5	35.4	0.0	1.3	1.2
	Tension Machine	Diesel	2.5	1	0.5910	0.1265	1.0686	0.0012	0.0576	0.0530	1.5	0.3	2.7	0.0	0.1	0.1
	Truck, Wire Puller, 3 Drum	Diesel	2.5	1	0.6496	0.1811	2.1214	0.0025	0.0719	0.0661	1.6	0.5	5.3	0.0	0.2	0.2
	Truck, Wire Puller, 1 Drum (OVHD Gr. Wr.)	Diesel	2.5	1	0.6496	0.1811	2.1214	0.0025	0.0719	0.0661	1.6	0.5	5.3	0.0	0.2	0.2
	Compressor	Gasoline	5	1	5.7144	0.1560	0.0963	0.0002	0.0756	0.0571	28.6	0.8	0.5	0.0	0.4	0.3
	Crawler, Track Type, w/ Blade (D8 type)	Diesel	2.5	1	1.2793	0.3022	2.8640	0.0025	0.1150	0.1058	3.2	0.8	7.2	0.0	0.3	0.3
	Crawler, Track Type, Sagging (D8 type)	Diesel	4	1	1.2793	0.3022	2.8640	0.0025	0.1150	0.1058	5.1	1.2	11.5	0.0	0.5	0.4
	Backhoe, w/Bucket	Diesel	3.5	1	0.3664	0.1000	0.6082	0.0006	0.0558	0.0514	1.3	0.3	2.1	0.0	0.2	0.2
	Digger, Transmission Type, Truck Mount	Diesel	1	1	0.8496	0.2900	2.8069	0.0025	0.1154	0.1062	0.8	0.3	2.8	0.0	0.1	0.1
	Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	9	3	0.4902	0.1281	0.9859	0.0009	0.0566	0.0521	13.2	3.5	26.6	0.0	1.5	1.4
	Generator	Gasoline	9	3	1.5828	0.1232	0.0217	0.0001	0.0087	0.0066	42.7	3.3	0.6	0.0	0.2	0.2
Conductor Total											**109.5**	**14.9**	**99.9**	**0.1**	**5.1**	**4.5**
Cleanup	Truck, Flatbed w/Boom, 5 Ton	Diesel	5	1	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	1.8	0.7	6.6	0.0	0.2	0.2
	Backhoe, w/Bucket	Diesel	3	1	0.3664	0.1000	0.6082	0.0006	0.0558	0.0514	1.1	0.3	1.8	0.0	0.2	0.2
	Compressor	Gasoline	5	1	5.7144	0.1560	0.0963	0.0002	0.0756	0.0571	28.6	0.8	0.5	0.0	0.4	0.3
	Crawler, Track Type, w/ Blade (D6 type)	Diesel	7.5	1	0.7652	0.2048	1.5628	0.0014	0.0900	0.0828	5.7	1.5	11.7	0.0	0.7	0.6
	Motor Grader	Diesel	7.5	1	0.5520	0.1672	0.9824	0.0009	0.0904	0.0832	4.1	1.3	7.4	0.0	0.7	0.6
Cleanup Total											**41.4**	**4.5**	**27.9**	**0.0**	**2.1**	**1.9**
Wreck-Out	Truck, Flatbed w/Boom, 5 Ton	Diesel	9	2	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	6.6	2.4	23.6	0.0	0.9	0.8
	Truck, Wire Puller, 1 Drum	Diesel	9	1	0.6496	0.1811	2.1214	0.0025	0.0719	0.0661	5.8	1.6	19.1	0.0	0.6	0.6
	Crawler, Track Type, w/ Blade (D6 type)	Diesel	9	1	0.7652	0.2048	1.5628	0.0014	0.0900	0.0828	6.9	1.8	14.1	0.0	0.8	0.7
	Truck, Manlift	Diesel	9	3	0.3642	0.1310	1.3109	0.0013	0.0499	0.0459	9.8	3.5	35.4	0.0	1.3	1.2
	Backhoe, w/Bucket	Diesel	9	1	0.3664	0.1000	0.6082	0.0006	0.0558	0.0514	3.3	0.9	5.5	0.0	0.5	0.5
	Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	5	1	0.4902	0.1281	0.9859	0.0009	0.0566	0.0521	2.5	0.6	4.9	0.0	0.3	0.3
	Generator	Gasoline	1	2	1.5828	0.1232	0.0217	0.0001	0.0087	0.0066	3.2	0.2	0.0	0.0	0.0	0.0
Wreck-Out Total											**38.0**	**11.2**	**102.6**	**0.1**	**4.5**	**4.1**

Note: Totals may not match sum of individual values because of rounding.

Table 24-B
Transmission Line Segment 2 Construction Motor Vehicle Exhaust Emissions

					Emission Factors (lb/hr)						Emissions (lb/day)					
Phase	**Vehicle Type**	**Fuel**	**Miles/Day**	**Number**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**
On-site Vehicles																
Marshalling Yards	On-Site Semi Tractor	Diesel	5	3	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.2	0.0	0.6	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	5	3	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.1	0.0	0.0	0.0	0.0	0.0
	On-Site Dump Truck	Diesel	5	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.2	0.0	0.0	0.0
Marshalling Yards Total											**0.3**	**0.1**	**0.8**	**0.0**	**0.0**	**0.0**
Road Work	On-Site Semi Tractor	Diesel	11	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.2	0.1	0.8	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	11	1	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.1	0.0	0.0	0.0	0.0	0.0
Road Work Total											**0.3**	**0.1**	**0.8**	**0.0**	**0.0**	**0.0**
Tower and Substation Foundation	On-Site Flatbed Truck, 5 Ton	Gasoline	11	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	1.5	0.1	0.2	0.0	0.0	0.0
	On-Site Cement Trucks	Diesel	11	8	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.9	0.2	3.3	0.0	0.1	0.1
	On-Site Semi Tractor	Diesel	11	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.2	0.1	0.8	0.0	0.0	0.0
	On-Site Dump Truck	Diesel	11	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.2	0.1	0.8	0.0	0.0	0.0
	On-Site Watering Truck	Diesel	11	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Mechanics Truck	Diesel	11	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	11	2	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.2	0.0	0.0	0.0	0.0	0.0
	On-Site Flatbed Truck	Gasoline	11	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	1.5	0.1	0.2	0.0	0.0	0.0
Tower and Substation Foundation Total											**4.7**	**0.6**	**6.2**	**0.0**	**0.2**	**0.2**
Steel	On-Site Flatbed Truck, 2 Ton	Gasoline	3	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.4	0.0	0.1	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	3	4	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.1	0.0	0.0	0.0	0.0	0.0
	On-Site Flatbed Truck	Gasoline	3	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.4	0.0	0.1	0.0	0.0	0.0
	On-Site Semi Tractor	Diesel	3	4	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Watering Truck	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
	On-Site Mechanics Truck	Diesel	3	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.0	0.0	0.1	0.0	0.0	0.0
Steel Total											**1.1**	**0.1**	**0.8**	**0.0**	**0.0**	**0.0**
Conductor	On-Site Semi Tractor	Diesel	11	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.2	0.1	0.8	0.0	0.0	0.0
	On-Site Watering Truck	Diesel	11	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Flatbed Truck	Gasoline	11	2	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	1.5	0.1	0.2	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	11	3	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.3	0.0	0.0	0.0	0.0	0.0
	On-Site Mechanics Truck	Diesel	11	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
Conductor Total											**2.2**	**0.2**	**1.9**	**0.0**	**0.1**	**0.1**
Cleanup	On-Site Dump Truck	Diesel	11	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.2	0.1	0.8	0.0	0.0	0.0
	On-Site Semi Tractor	Diesel	11	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Flatbed Truck	Gasoline	11	1	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	0.7	0.0	0.1	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	11	1	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.1	0.0	0.0	0.0	0.0	0.0
Cleanup Total											**5.6**	**0.6**	**5.1**	**0.0**	**0.2**	**0.2**
Wreck-Out	On-Site Dump Truck	Diesel	11	2	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.2	0.1	0.8	0.0	0.0	0.0
	On-Site Watering Truck	Diesel	11	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Flatbed Truck, 5 Ton	Gasoline	11	3	0.0660	0.0040	0.0100	0.0000	0.0000	0.0000	2.2	0.1	0.3	0.0	0.0	0.0
	On-Site Semi Tractor	Diesel	11	3	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.3	0.1	1.2	0.0	0.1	0.0
	On-Site Mechanics Truck	Diesel	11	1	0.0104	0.0025	0.0370	0.0001	0.0015	0.0014	0.1	0.0	0.4	0.0	0.0	0.0
	On-Site Pickup Truck	Gasoline	11	3	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	0.3	0.0	0.0	0.0	0.0	0.0
Wreck-Out Total											**3.3**	**0.4**	**3.2**	**0.0**	**0.1**	**0.1**
Off-Site Vehicles																
Marshalling Yards	Off-Site Construction Worker Commute	Gasoline	60	6	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	3.1	0.3	0.3	0.0	0.0	0.0
Road Work	Off-Site Construction Worker Commute	Gasoline	60	3	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	1.6	0.1	0.1	0.0	0.0	0.0
Tower and Substation Foundation	Off-Site Construction Worker Commute	Gasoline	60	29	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	15.2	1.4	1.3	0.0	0.1	0.0
Steel	Off-Site Construction Worker Commute	Gasoline	60	24	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	12.6	1.2	1.1	0.0	0.0	0.0
Conductor	Off-Site Construction Worker Commute	Gasoline	60	17	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	8.9	0.8	0.8	0.0	0.0	0.0
Cleanup	Off-Site Construction Worker Commute	Gasoline	60	6	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	3.1	0.3	0.3	0.0	0.0	0.0
Wreck-Out	Off-Site Construction Worker Commute	Gasoline	60	14	0.0087	0.0008	0.0007	0.0000	0.0000	0.0000	7.3	0.7	0.6	0.0	0.0	0.0

Note: Totals may not match sum of individual values because of rounding.

Table 24-C
Transmission Line Segment 2 Construction Motor Vehicle Fugitive PM10 and PM2.5 Emissions

Phase	Vehicle Type	Miles/Day	Number	Emission Factors (lb/mi)		Emissions (lb/day)	
				PM10	PM2.5	PM10	PM2.5
On-site Vehicles							
Marshalling Yards	On-Site Semi Tractor	5	3	1.0424	0.2210	15.6	3.3
	On-Site Pickup Truck	5	3	1.0424	0.2210	15.6	3.3
	On-Site Dump Truck	5	1	1.0424	0.2210	5.2	1.1
Marshalling Yards Total						**36.5**	**7.7**
Road Work	On-Site Semi Tractor	11	2	1.0424	0.2210	22.9	4.9
	On-Site Pickup Truck	11	1	1.0424	0.2210	11.5	2.4
Road Work Total						**34.4**	**7.3**
Tower and Substation Foundation	On-Site Flatbed Truck, 5 Ton	11	2	1.0423	0.2210	22.9	4.9
	On-Site Cement Trucks	11	8	1.0424	0.2210	91.7	19.4
	On-Site Semi Tractor	11	2	1.0424	0.2210	22.9	4.9
	On-Site Dump Truck	11	2	1.0424	0.2210	22.9	4.9
	On-Site Watering Truck	11	1	0.0001	0.0000	0.0	0.0
	On-Site Mechanics Truck	11	1	1.0424	0.2210	11.5	2.4
	On-Site Pickup Truck	11	2	1.0424	0.2210	22.9	4.9
	On-Site Flatbed Truck	11	2	1.0423	0.2210	22.9	4.9
Tower and Substation Foundation Total						**217.9**	**46.2**
Steel	On-Site Flatbed Truck, 2 Ton	3	2	1.0423	0.2210	6.3	1.3
	On-Site Pickup Truck	3	4	1.0424	0.2210	12.5	2.7
	On-Site Flatbed Truck	3	2	1.0423	0.2210	6.3	1.3
	On-Site Semi Tractor	3	4	1.0424	0.2210	12.5	2.7
	On-Site Watering Truck	3	1	0.0001	0.0000	0.0	0.0
	On-Site Mechanics Truck	3	1	1.0424	0.2210	3.1	0.7
Steel Total						**40.7**	**8.6**
Conductor	On-Site Semi Tractor	11	2	1.0424	0.2210	22.9	4.9
	On-Site Watering Truck	11	1	0.0001	0.0000	0.0	0.0
	On-Site Flatbed Truck	11	2	1.0423	0.2210	22.9	4.9
	On-Site Pickup Truck	11	3	1.0424	0.2210	34.4	7.3
	On-Site Mechanics Truck	11	1	1.0424	0.2210	11.5	2.4
Conductor Total						**91.7**	**19.4**
Cleanup	On-Site Dump Truck	11	2	1.0424	0.2210	22.9	4.9
	On-Site Semi Tractor	11	1	1.0424	0.2210	11.5	2.4
	On-Site Flatbed Truck	11	1	1.0423	0.2210	11.5	2.4
	On-Site Pickup Truck	11	1	1.0424	0.2210	11.5	2.4
Cleanup Total						**57.3**	**12.2**
Wreck-Out	On-Site Dump Truck	11	2	1.0424	0.2210	22.9	4.9
	On-Site Watering Truck	11	1	0.0001	0.0000	0.0	0.0
	On-Site Flatbed Truck, 5 Ton	11	3	1.0423	0.2210	34.4	7.3
	On-Site Semi Tractor	11	3	1.0424	0.2210	34.4	7.3
	On-Site Mechanics Truck	11	1	1.0424	0.2210	11.5	2.4
	On-Site Pickup Truck	11	3	1.0424	0.2210	34.4	7.3
Wreck-Out Total						**137.6**	**29.2**
Off-Site Vehicles							
Marshalling Yards	Off-Site Construction Worker Commute	60	6	0.0009	0.0002	0.3	0.1
Road Work	Off-Site Construction Worker Commute	60	3	0.0009	0.0002	0.2	0.0
Tower and Substation Foundation	Off-Site Construction Worker Commute	60	29	0.0009	0.0002	1.6	0.3
Steel	Off-Site Construction Worker Commute	60	24	0.0009	0.0002	1.3	0.2
Conductor	Off-Site Construction Worker Commute	60	17	0.0009	0.0002	0.9	0.2
Cleanup	Off-Site Construction Worker Commute	60	6	0.0009	0.0002	0.3	0.1
Wreck-Out	Off-Site Construction Worker Commute	60	14	0.0009	0.0002	0.8	0.1

Note: Totals may not match sum of individual values because of rounding.

Table 24-D
Transmission Line Segment 2 Construction Daily Fugitive PM10 and PM2.5 Emissions

Phase	Activity	Units	Quantity/ Day	Emission Factors		Emissions (lb/day)	
				PM10	**PM2.5**	**PM10**	**PM2.5**
Marshalling Yards	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	0.0	0.617	0.128	0.0	0.0
Marshalling Yards Total						**0.0**	**0.0**
Road Work	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	9.0	0.617	0.128	5.6	1.2
Road Work Total						**5.6**	**1.2**
Tower and Substation Foundation	Excavation	Cu. Yd.	237	9.94E-04	2.07E-04	0.2	0.0
	Storage Pile Wind Erosion	Acres-Days	0.02	4.29	0.89	0.1	0.0
	Bulldozing and Grading	Hours	0.0	0.617	0.128	0.0	0.0
Tower and Substation Foundation Total						**0.3**	**0.1**
Steel	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	6.0	0.617	0.128	3.7	0.8
Steel Total						**3.7**	**0.8**
Conductor	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	2.5	0.617	0.128	1.5	0.3
Conductor Total						**1.5**	**0.3**
Cleanup	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	15.0	0.617	0.128	9.3	1.9
Cleanup Total						**9.3**	**1.9**
Wreck-Out	Excavation	Cu. Yd.	0	9.94E-04	2.07E-04	0.0	0.0
	Storage Pile Wind Erosion	Acres-Days	0.00	4.29	0.89	0.0	0.0
	Bulldozing and Grading	Hours	9.0	0.617	0.128	5.6	1.2
Wreck-Out Total						**5.6**	**1.2**

Note: Totals may not match sum of individual values because of rounding.

Table 25-A
Transmission Line Segment 1 Construction Daily CO Emissions Summary

	First Month	Last Month	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
On-Site														
Equipment														
Marshalling Yards	1	26	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
Road Work	1	4	14.7	14.7	14.7	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.9	30.9	30.9
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**23.8**	**23.8**	**23.8**	**23.8**	**60.4**	**60.4**	**60.4**	**60.4**	**60.4**	**91.3**	**91.3**	**91.3**
Motor Vehicles														
Marshalling Yards	1	26	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Road Work	1	4	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.6**	**0.6**	**0.6**	**0.6**	**1.6**	**1.6**	**1.6**	**1.6**	**1.6**	**2.7**	**2.7**	**2.7**
On-Site Total			**24.4**	**24.4**	**24.4**	**24.4**	**62.0**	**62.0**	**62.0**	**62.0**	**62.0**	**94.0**	**94.0**	**94.0**
Off-Site Motor Vehicles														
Marshalling Yards	1	26	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Road Work	1	4	1.6	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.7	14.7	14.7
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**4.7**	**4.7**	**4.7**	**4.7**	**13.6**	**13.6**	**13.6**	**13.6**	**13.6**	**28.3**	**28.3**	**28.3**
Monthly Total			**29.1**	**29.1**	**29.1**	**29.1**	**75.6**	**75.6**	**75.6**	**75.6**	**75.6**	**122.3**	**122.3**	**122.3**
Maximum Daily Total (lb/day)			**156.1**											

Table 25-A (continued)
Transmission Line Segment 1 Construction Daily CO Emissions Summary

	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26
On-Site														
Equipment														
Marshalling Yards	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	51.3	51.3	51.3	51.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	30.9	30.9	30.9	30.9	30.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	88.3	88.3	88.3	88.3	88.3	88.3	88.3	88.3	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.1	16.1
Equipment Total	**91.3**	**91.3**	**91.3**	**91.3**	**128.3**	**97.4**	**97.4**	**97.4**	**97.4**	**97.4**	**97.4**	**97.4**	**25.2**	**25.2**
Motor Vehicles														
Marshalling Yards	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	1.1	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5
Motor Vehicle Total	**2.7**	**2.7**	**2.7**	**2.7**	**2.2**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**2.0**	**2.0**
On-Site Total	**94.0**	**94.0**	**94.0**	**94.0**	**130.5**	**98.5**	**98.5**	**98.5**	**98.5**	**98.5**	**98.5**	**98.5**	**27.2**	**27.2**
Off-Site Motor Vehicles														
Marshalling Yards	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	10.5	10.5	10.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	14.7	14.7	14.7	14.7	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1
Off-Site Total	**28.3**	**28.3**	**28.3**	**28.3**	**25.6**	**11.0**	**11.0**	**11.0**	**11.0**	**11.0**	**11.0**	**11.0**	**5.2**	**5.2**
Monthly Total	**122.3**	**122.3**	**122.3**	**122.3**	**156.1**	**109.5**	**109.5**	**109.5**	**109.5**	**109.5**	**109.5**	**109.5**	**32.4**	**32.4**

Note: Totals may not match sum of individual values because of rounding.

Table 25-B
Transmission Line Segment 1 Construction Daily VOC Emissions Summary

	First Month	Last Month	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
On-Site														
Equipment														
Marshalling Yards	1	26	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Road Work	1	4	3.8	3.8	3.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	9.4	9.4
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**6.5**	**6.5**	**6.5**	**6.5**	**11.7**	**11.7**	**11.7**	**11.7**	**11.7**	**21.1**	**21.1**	**21.1**
Motor Vehicles														
Marshalling Yards	1	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**
On-Site Total			**6.6**	**6.6**	**6.6**	**6.6**	**11.9**	**11.9**	**11.9**	**11.9**	**11.9**	**21.4**	**21.4**	**21.4**
Off-Site Motor Vehicles														
Marshalling Yards	1	26	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	1	4	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**0.4**	**0.4**	**0.4**	**0.4**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**2.6**	**2.6**	**2.6**
Monthly Total			**7.0**	**7.0**	**7.0**	**7.0**	**13.1**	**13.1**	**13.1**	**13.1**	**13.1**	**24.0**	**24.0**	**24.0**
Maximum Daily Total (lb/day)			**30.0**											

Table 25-B (continued)
Transmission Line Segment 1 Construction Daily VOC Emissions Summary

	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26
On-Site														
Equipment														
Marshalling Yards	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	9.0	9.0	9.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	9.4	9.4	9.4	9.4	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	4.8
Equipment Total	**21.1**	**21.1**	**21.1**	**21.1**	**27.4**	**18.0**	**18.0**	**18.0**	**18.0**	**18.0**	**18.0**	**18.0**	**7.5**	**7.5**
Motor Vehicles														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Motor Vehicle Total	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**
On-Site Total	**21.4**	**21.4**	**21.4**	**21.4**	**27.6**	**18.1**	**18.1**	**18.1**	**18.1**	**18.1**	**18.1**	**18.1**	**7.7**	**7.7**
Off-Site Motor Vehicles														
Marshalling Yards	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Off-Site Total	**2.6**	**2.6**	**2.6**	**2.6**	**2.4**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**0.5**	**0.5**
Monthly Total	**24.0**	**24.0**	**24.0**	**24.0**	**30.0**	**19.2**	**19.2**	**19.2**	**19.2**	**19.2**	**19.2**	**19.2**	**8.2**	**8.2**

Note: Totals may not match sum of individual values because of rounding.

Table 25-C
Transmission Line Segment 1 Construction Daily NOx Emissions Summary

	First Month	Last Month	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
On-Site														
Equipment														
Marshalling Yards	1	26	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4
Road Work	1	4	30.8	30.8	30.8	30.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.2	83.2	83.2
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**57.2**	**57.2**	**57.2**	**57.2**	**90.6**	**90.6**	**90.6**	**90.6**	**90.6**	**173.8**	**173.8**	**173.8**
Motor Vehicles														
Marshalling Yards	1	26	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Road Work	1	4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.7**	**0.7**	**0.7**	**0.7**	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**	**2.3**	**2.3**	**2.3**
On-Site Total			**57.9**	**57.9**	**57.9**	**57.9**	**92.1**	**92.1**	**92.1**	**92.1**	**92.1**	**176.1**	**176.1**	**176.1**
Off-Site Motor Vehicles														
Marshalling Yards	1	26	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	1	4	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.2
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**0.4**	**0.4**	**0.4**	**0.4**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**2.4**	**2.4**	**2.4**
Monthly Total			**58.3**	**58.3**	**58.3**	**58.3**	**93.3**	**93.3**	**93.3**	**93.3**	**93.3**	**178.5**	**178.5**	**178.5**
Maximum Daily Total (lb/day)			**219.7**											

Table 25-C (continued)
Transmission Line Segment 1 Construction Daily NOx Emissions Summary

	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26
On-Site														
Equipment														
Marshalling Yards	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	64.2	64.2	64.2	64.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	83.2	83.2	83.2	83.2	83.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.9	35.9
Equipment Total	**173.8**	**173.8**	**173.8**	**173.8**	**216.0**	**132.8**	**132.8**	**132.8**	**132.8**	**132.8**	**132.8**	**132.8**	**62.4**	**62.4**
Motor Vehicles														
Marshalling Yards	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
Motor Vehicle Total	**2.3**	**2.3**	**2.3**	**2.3**	**1.5**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**1.5**	**1.5**
On-Site Total	**176.1**	**176.1**	**176.1**	**176.1**	**217.5**	**133.6**	**133.6**	**133.6**	**133.6**	**133.6**	**133.6**	**133.6**	**63.9**	**63.9**
Off-Site Motor Vehicles														
Marshalling Yards	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	0.9	0.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Off-Site Total	**2.4**	**2.4**	**2.4**	**2.4**	**2.2**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.4**	**0.4**
Monthly Total	**178.5**	**178.5**	**178.5**	**178.5**	**219.7**	**134.5**	**134.5**	**134.5**	**134.5**	**134.5**	**134.5**	**134.5**	**64.3**	**64.3**

Note: Totals may not match sum of individual values because of rounding.

Table 25-D
Transmission Line Segment 1 Construction Daily SOx Emissions Summary

	First Month	Last Month	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
On-Site														
Equipment														
Marshalling Yards	1	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**
Motor Vehicles														
Marshalling Yards	1	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
On-Site Total			**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**
Off-Site Motor Vehicles														
Marshalling Yards	1	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Total			**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**
Maximum Daily Total (lb/day)			**0.2**											

Table 25-D (continued)
Transmission Line Segment 1 Construction Daily SOx Emissions Summary

	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26
On-Site														
Equipment														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Motor Vehicles														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
On-Site Total	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Off-Site Motor Vehicles														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Total	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**

Note: Totals may not match sum of individual values because of rounding.

Table 25-E
Transmission Line Segment 1 Construction Daily PM10 Emissions Summary

	First Month	Last Month	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
On-Site														
Equipment														
Marshalling Yards	1	26	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Road Work	1	4	1.6	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	3.9	3.9
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**2.7**	**2.7**	**2.7**	**2.7**	**4.3**	**4.3**	**4.3**	**4.3**	**4.3**	**8.2**	**8.2**	**8.2**
Motor Vehicle Exhaust														
Marshalling Yards	1	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Fugitive														
Marshalling Yards			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	26	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6
Foundations	1	4	47.2	47.2	47.2	47.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	5	16	0.0	0.0	0.0	0.0	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
Conductor	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.6	26.6	26.6
Cleanup	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Total	25	26	**75.9**	**75.9**	**75.9**	**75.9**	**73.0**	**73.0**	**73.0**	**73.0**	**73.0**	**99.6**	**99.6**	**99.6**
On-Site Total			**78.6**	**78.6**	**78.6**	**78.6**	**77.4**	**77.4**	**77.4**	**77.4**	**77.4**	**107.8**	**107.8**	**107.8**
Off-Site Motor Vehicle Exhaust and Fugitive														
Marshalling Yards	1	26	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	1	4	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6	1.6
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**0.5**	**0.5**	**0.5**	**0.5**	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**	**3.1**	**3.1**	**3.1**
Monthly Total			**79.1**	**79.1**	**79.1**	**79.1**	**78.8**	**78.8**	**78.8**	**78.8**	**78.8**	**110.9**	**110.9**	**110.9**
Maximum Daily Total (lb/day)			**110.9**											

Table 25-E (continued)
Transmission Line Segment 1 Construction Daily PM10 Emissions Summary

	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26
On-Site														
Equipment														
Marshalling Yards	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	3.2	3.2	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	3.9	3.9	3.9	3.9	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2
Equipment Total	**8.2**	**8.2**	**8.2**	**8.2**	**9.9**	**6.1**	**6.1**	**6.1**	**6.1**	**6.1**	**6.1**	**6.1**	**3.3**	**3.3**
Motor Vehicle Exhaust														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**
Fugitive														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6
Foundations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	44.4	44.4	44.4	44.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	26.6	26.6	26.6	26.6	26.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	0.0	0.0
Fugitive Total	**99.6**	**99.6**	**99.6**	**99.6**	**80.1**	**53.5**	**53.5**	**53.5**	**53.5**	**53.5**	**53.5**	**53.5**	**28.6**	**28.6**
On-Site Total	**107.8**	**107.8**	**107.8**	**107.8**	**90.1**	**59.6**	**59.6**	**59.6**	**59.6**	**59.6**	**59.6**	**59.6**	**32.0**	**32.0**
Off-Site Motor Vehicle Exhaust and Fugitive														
Marshalling Yards	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	1.6	1.6	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Off-Site Total	**3.1**	**3.1**	**3.1**	**3.1**	**2.8**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**0.6**	**0.6**
Monthly Total	**110.9**	**110.9**	**110.9**	**110.9**	**92.8**	**60.8**	**60.8**	**60.8**	**60.8**	**60.8**	**60.8**	**60.8**	**32.5**	**32.5**

Note: Totals may not match sum of individual values because of rounding.

Table 25-F
Transmission Line Segment 1 Construction Daily PM2.5 Emissions Summary

	First Month	Last Month	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
On-Site														
Equipment														
Marshalling Yards	1	26	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Road Work	1	4	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	3.6	3.6
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**2.5**	**2.5**	**2.5**	**2.5**	**3.9**	**3.9**	**3.9**	**3.9**	**3.9**	**7.5**	**7.5**	**7.5**
Motor Vehicle Exhaust														
Marshalling Yards	1	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**
Fugitive														
Marshalling Yards			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	26	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Foundations	1	4	10.0	10.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	5	16	0.0	0.0	0.0	0.0	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Conductor	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6	5.6
Cleanup	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Total	25	26	**16.0**	**16.0**	**16.0**	**16.0**	**15.4**	**15.4**	**15.4**	**15.4**	**15.4**	**21.0**	**21.0**	**21.0**
On-Site Total			**18.6**	**18.6**	**18.6**	**18.6**	**19.4**	**19.4**	**19.4**	**19.4**	**19.4**	**28.6**	**28.6**	**28.6**
Off-Site Motor Vehicle Exhaust and Fugitive														
Marshalling Yards	1	26	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Road Work	1	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	5	16	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Steel	10	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3
Conductor	17	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	25	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**0.1**	**0.1**	**0.1**	**0.1**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.6**	**0.6**	**0.6**
Monthly Total			**18.7**	**18.7**	**18.7**	**18.7**	**19.7**	**19.7**	**19.7**	**19.7**	**19.7**	**29.2**	**29.2**	**29.2**
Maximum Daily Total (lb/day)			**29.2**											

Table 25-F (continued)
Transmission Line Segment 1 Construction Daily PM2.5 Emissions Summary

	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26
On-Site														
Equipment														
Marshalling Yards	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	3.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	3.6	3.6	3.6	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0
Equipment Total	**7.5**	**7.5**	**7.5**	**7.5**	**9.1**	**5.5**	**5.5**	**5.5**	**5.5**	**5.5**	**5.5**	**5.5**	**3.0**	**3.0**
Motor Vehicle Exhaust														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**
Fugitive														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Foundations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	9.4	9.4	9.4	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	5.6	5.6	5.6	5.6	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	0.0	0.0
Fugitive Total	**21.0**	**21.0**	**21.0**	**21.0**	**16.9**	**11.3**	**11.3**	**11.3**	**11.3**	**11.3**	**11.3**	**11.3**	**6.0**	**6.0**
On-Site Total	**28.6**	**28.6**	**28.6**	**28.6**	**26.0**	**16.8**	**16.8**	**16.8**	**16.8**	**16.8**	**16.8**	**16.8**	**9.1**	**9.1**
Off-Site Motor Vehicle Exhaust and Fugitive														
Marshalling Yards	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foundations	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**
Monthly Total	**29.2**	**29.2**	**29.2**	**29.2**	**26.6**	**17.1**	**17.1**	**17.1**	**17.1**	**17.1**	**17.1**	**17.1**	**9.2**	**9.2**

Note: Totals may not match sum of individual values because of rounding.

Table 26-A
Transmission Line Segment 2 Construction Daily CO Emissions Summary

	First Week	Last Week	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
On-Site															
Equipment															
Marshalling Yards	1	27	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2
Road Work	1	1	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	63.7	63.7	63.7	63.7	63.7	63.7	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	38.0	38.0	38.0	38.0	38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**70.1**	**123.0**	**123.0**	**123.0**	**123.0**	**115.9**	**115.9**	**52.2**	**52.2**	**52.2**	**52.2**	**52.2**	**52.2**
Motor Vehicles															
Marshalling Yards	1	27	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	1	1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	4.7	4.7	4.7	4.7	4.7	4.7	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	3.3	3.3	3.3	3.3	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**3.9**	**8.3**	**8.3**	**8.3**	**8.3**	**6.1**	**6.1**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**
On-Site Total			**74.0**	**131.3**	**131.3**	**131.3**	**131.3**	**122.0**	**122.0**	**53.6**	**53.6**	**53.6**	**53.6**	**53.6**	**53.6**
Off-Site Motor Vehicles															
Marshalling Yards	1	27	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Road Work	1	1	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	15.2	15.2	15.2	15.2	15.2	15.2	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	7.3	7.3	7.3	7.3	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**12.0**	**25.6**	**25.6**	**25.6**	**25.6**	**30.9**	**30.9**	**15.7**	**15.7**	**15.7**	**15.7**	**15.7**	**15.7**
Monthly Total			**86.0**	**156.9**	**156.9**	**156.9**	**156.9**	**152.9**	**152.9**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**	**69.3**
Maximum Daily Total (lb/day)			**195.4**												

Table 26-A (continued)
Transmission Line Segment 2 Construction Daily CO Emissions Summary

	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27
On-Site														
Equipment														
Marshalling Yards	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	30.9	30.9	30.9	30.9	30.9	30.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	109.5	109.5	109.5	109.5	109.5	109.5	109.5	109.5	109.5	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.4	41.4	41.4	41.4
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total	**52.2**	**52.2**	**52.2**	**52.2**	**161.7**	**161.7**	**130.8**	**130.8**	**130.8**	**130.8**	**172.2**	**172.2**	**172.2**	**62.6**
Motor Vehicles														
Marshalling Yards	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6	5.6	5.6
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total	**1.4**	**1.4**	**1.4**	**1.4**	**3.6**	**3.6**	**2.5**	**2.5**	**2.5**	**2.5**	**8.1**	**8.1**	**8.1**	**5.9**
On-Site Total	**53.6**	**53.6**	**53.6**	**53.6**	**165.3**	**165.3**	**133.3**	**133.3**	**133.3**	**133.3**	**180.3**	**180.3**	**180.3**	**68.5**
Off-Site Motor Vehicles														
Marshalling Yards	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	12.6	12.6	12.6	12.6	12.6	12.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	3.1	3.1	3.1
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total	**15.7**	**15.7**	**15.7**	**15.7**	**24.6**	**24.6**	**12.0**	**12.0**	**12.0**	**12.0**	**15.2**	**15.2**	**15.2**	**6.3**
Monthly Total	**69.3**	**69.3**	**69.3**	**69.3**	**189.9**	**189.9**	**145.4**	**145.4**	**145.4**	**145.4**	**195.4**	**195.4**	**195.4**	**74.8**

Note: Totals may not match sum of individual values because of rounding.

Table 26-B
Transmission Line Segment 2 Construction Daily VOC Emissions Summary

	First Week	Last Week	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
On-Site															
Equipment															
Marshalling Yards	1	27	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
Road Work	1	1	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	8.4	8.4	8.4	8.4	8.4	8.4	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	11.2	11.2	11.2	11.2	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**20.5**	**26.4**	**26.4**	**26.4**	**26.4**	**24.6**	**24.6**	**16.2**	**16.2**	**16.2**	**16.2**	**16.2**	**16.2**
Motor Vehicles															
Marshalling Yards	1	27	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Road Work	1	1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.5**	**1.0**	**1.0**	**1.0**	**1.0**	**0.7**	**0.7**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
On-Site Total			**21.0**	**27.3**	**27.3**	**27.3**	**27.3**	**25.3**	**25.3**	**16.4**	**16.4**	**16.4**	**16.4**	**16.4**	**16.4**
Off-Site Motor Vehicles															
Marshalling Yards	1	27	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	1	1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	1.4	1.4	1.4	1.4	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**1.1**	**2.4**	**2.4**	**2.4**	**2.4**	**2.8**	**2.8**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**
Monthly Total			**22.1**	**29.7**	**29.7**	**29.7**	**29.7**	**28.2**	**28.2**	**17.8**	**17.8**	**17.8**	**17.8**	**17.8**	**17.8**
Maximum Daily Total (lb/day)			**33.8**												

Table 26-B (continued)
Transmission Line Segment 2 Construction Daily VOC Emissions Summary

	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27
On-Site														
Equipment														
Marshalling Yards	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	9.4	9.4	9.4	9.4	9.4	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	4.5	4.5	4.5
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total	**16.2**	**16.2**	**16.2**	**16.2**	**31.1**	**31.1**	**21.7**	**21.7**	**21.7**	**21.7**	**26.2**	**26.2**	**26.2**	**11.3**
Motor Vehicles														
Marshalling Yards	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total	**0.2**	**0.2**	**0.2**	**0.2**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.9**	**0.9**	**0.9**	**0.6**
On-Site Total	**16.4**	**16.4**	**16.4**	**16.4**	**31.5**	**31.5**	**22.0**	**22.0**	**22.0**	**22.0**	**27.1**	**27.1**	**27.1**	**12.0**
Off-Site Motor Vehicles														
Marshalling Yards	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	1.2	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total	**1.4**	**1.4**	**1.4**	**1.4**	**2.3**	**2.3**	**1.1**	**1.1**	**1.1**	**1.1**	**1.4**	**1.4**	**1.4**	**0.6**
Monthly Total	**17.8**	**17.8**	**17.8**	**17.8**	**33.8**	**33.8**	**23.1**	**23.1**	**23.1**	**23.1**	**28.5**	**28.5**	**28.5**	**12.5**

Note: Totals may not match sum of individual values because of rounding.

Table 26-C
Transmission Line Segment 2 Construction Daily NOx Emissions Summary

	First Week	Last Week	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
On-Site															
Equipment															
Marshalling Yards	1	27	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Road Work	1	1	23.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	53.4	53.4	53.4	53.4	53.4	53.4	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	83.2	83.2	83.2	83.2	83.2	83.2	83.2	83.2
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	102.6	102.6	102.6	102.6	102.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**193.5**	**223.0**	**223.0**	**223.0**	**223.0**	**203.6**	**203.6**	**150.2**	**150.2**	**150.2**	**150.2**	**150.2**	**150.2**
Motor Vehicles															
Marshalling Yards	1	27	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Road Work	1	1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	6.2	6.2	6.2	6.2	6.2	6.2	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	3.2	3.2	3.2	3.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**4.8**	**10.1**	**10.1**	**10.1**	**10.1**	**7.7**	**7.7**	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**
On-Site Total			**198.3**	**233.1**	**233.1**	**233.1**	**233.1**	**211.3**	**211.3**	**151.7**	**151.7**	**151.7**	**151.7**	**151.7**	**151.7**
Off-Site Motor Vehicles															
Marshalling Yards	1	27	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	1	1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**1.0**	**2.2**	**2.2**	**2.2**	**2.2**	**2.6**	**2.6**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**
Monthly Total			**199.3**	**235.3**	**235.3**	**235.3**	**235.3**	**213.9**	**213.9**	**153.1**	**153.1**	**153.1**	**153.1**	**153.1**	**153.1**
Maximum Daily Total (lb/day)			**255.6**												

Table 26-C (continued)
Transmission Line Segment 2 Construction Daily NOx Emissions Summary

	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27
On-Site														
Equipment														
Marshalling Yards	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	83.2	83.2	83.2	83.2	83.2	83.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.9	27.9	27.9	27.9
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total	**150.2**	**150.2**	**150.2**	**150.2**	**250.1**	**250.1**	**166.9**	**166.9**	**166.9**	**166.9**	**194.9**	**194.9**	**194.9**	**95.0**
Motor Vehicles														
Marshalling Yards	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.8	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	5.1	5.1	5.1
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total	**1.5**	**1.5**	**1.5**	**1.5**	**3.4**	**3.4**	**2.6**	**2.6**	**2.6**	**2.6**	**7.7**	**7.7**	**7.7**	**5.8**
On-Site Total	**151.7**	**151.7**	**151.7**	**151.7**	**253.5**	**253.5**	**169.5**	**169.5**	**169.5**	**169.5**	**202.6**	**202.6**	**202.6**	**100.8**
Off-Site Motor Vehicles														
Marshalling Yards	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total	**1.3**	**1.3**	**1.3**	**1.3**	**2.1**	**2.1**	**1.0**	**1.0**	**1.0**	**1.0**	**1.3**	**1.3**	**1.3**	**0.5**
Monthly Total	**153.1**	**153.1**	**153.1**	**153.1**	**255.6**	**255.6**	**170.6**	**170.6**	**170.6**	**170.6**	**203.9**	**203.9**	**203.9**	**101.3**

Note: Totals may not match sum of individual values because of rounding.

Table 26-D
Transmission Line Segment 2 Construction Daily SOx Emissions Summary

	First Week	Last Week	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
On-Site															
Equipment															
Marshalling Yards	1	27	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Road Work	1	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Motor Vehicles															
Marshalling Yards	1	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
On-Site Total			**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Off-Site Motor Vehicles															
Marshalling Yards	1	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Total			**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Maximum Daily Total (lb/day)			**0.3**												

Table 26-D (continued)
Transmission Line Segment 2 Construction Daily SOx Emissions Summary

	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27
On-Site														
Equipment														
Marshalling Yards	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**
Motor Vehicles														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
On-Site Total	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**
Off-Site Motor Vehicles														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Monthly Total	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**

Note: Totals may not match sum of individual values because of rounding.

Table 26-E
Transmission Line Segment 2 Construction Daily PM10 Emissions Summary

	First Week	Last Week	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
On-Site															
Equipment															
Marshalling Yards	1	27	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Road Work	1	1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	2.1	2.1	2.1	2.1	2.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	4.5	4.5	4.5	4.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**8.1**	**9.2**	**9.2**	**9.2**	**9.2**	**8.6**	**8.6**	**6.4**	**6.4**	**6.4**	**6.4**	**6.4**	**6.4**
Motor Vehicle Exhaust															
Marshalling Yards	1	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.2**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Fugitive															
Marshalling Yards	1	27	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
Road Work	1	1	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	218.2	218.2	218.2	218.2	218.2	218.2	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	143.2	143.2	143.2	143.2	143.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Total			**219.6**	**397.8**	**397.8**	**397.8**	**397.8**	**299.0**	**299.0**	**80.8**	**80.8**	**80.8**	**80.8**	**80.8**	**80.8**
On-Site Total			**227.9**	**407.4**	**407.4**	**407.4**	**407.4**	**307.9**	**307.9**	**87.3**	**87.3**	**87.3**	**87.3**	**87.3**	**87.3**
Off-Site Motor Vehicle Exhaust and Fugitive															
Marshalling Yards	1	27	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	1	1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	1.7	1.7	1.7	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.8	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**1.3**	**2.8**	**2.8**	**2.8**	**2.8**	**3.4**	**3.4**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**
Monthly Total			**229.2**	**410.2**	**410.2**	**410.2**	**410.2**	**311.3**	**311.3**	**89.0**	**89.0**	**89.0**	**89.0**	**89.0**	**89.0**
Maximum Daily Total (lb/day)			**410.2**												

Table 26-E (continued)
Transmission Line Segment 2 Construction Daily PM10 Emissions Summary

	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27
On-Site														
Equipment														
Marshalling Yards	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	3.9	3.9	3.9	3.9	3.9	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.1	2.1	2.1
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total	**6.4**	**6.4**	**6.4**	**6.4**	**11.5**	**11.5**	**7.6**	**7.6**	**7.6**	**7.6**	**9.8**	**9.8**	**9.8**	**4.7**
Motor Vehicle Exhaust														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.3**	**0.3**	**0.3**	**0.2**
Fugitive														
Marshalling Yards	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	44.4	44.4	44.4	44.4	44.4	44.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	93.3	93.3	93.3	93.3	93.3	93.3	93.3	93.3	93.3	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.6	66.6	66.6	66.6
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Total	**80.8**	**80.8**	**80.8**	**80.8**	**174.1**	**174.1**	**129.8**	**129.8**	**129.8**	**129.8**	**196.4**	**196.4**	**196.4**	**103.1**
On-Site Total	**87.3**	**87.3**	**87.3**	**87.3**	**185.7**	**185.7**	**137.5**	**137.5**	**137.5**	**137.5**	**206.4**	**206.4**	**206.4**	**108.0**
Off-Site Motor Vehicle Exhaust and Fugitive														
Marshalling Yards	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	1.4	1.4	1.4	1.4	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total	**1.7**	**1.7**	**1.7**	**1.7**	**2.7**	**2.7**	**1.3**	**1.3**	**1.3**	**1.3**	**1.7**	**1.7**	**1.7**	**0.7**
Monthly Total	**89.0**	**89.0**	**89.0**	**89.0**	**188.4**	**188.4**	**138.8**	**138.8**	**138.8**	**138.8**	**208.1**	**208.1**	**208.1**	**108.7**

Note: Totals may not match sum of individual values because of rounding.

Table 26-F
Transmission Line Segment 2 Construction Daily PM2.5 Emissions Summary

	First Week	Last Week	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
On-Site															
Equipment															
Marshalling Yards	1	27	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Road Work	1	1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	1.9	1.9	1.9	1.9	1.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	4.1	4.1	4.1	4.1	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total			**7.4**	**8.4**	**8.4**	**8.4**	**8.4**	**7.8**	**7.8**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**
Motor Vehicle Exhaust															
Marshalling Yards	1	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	1	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total			**0.2**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Fugitive															
Marshalling Yards	1	27	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Road Work	1	1	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	46.3	46.3	46.3	46.3	46.3	46.3	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	30.3	30.3	30.3	30.3	30.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Total			**46.5**	**84.3**	**84.3**	**84.3**	**84.3**	**63.4**	**63.4**	**17.1**	**17.1**	**17.1**	**17.1**	**17.1**	**17.1**
On-Site Total			**54.1**	**93.1**	**93.1**	**93.1**	**93.1**	**71.5**	**71.5**	**23.1**	**23.1**	**23.1**	**23.1**	**23.1**	**23.1**
Off-Site Motor Vehicle Exhaust and Fugitive															
Marshalling Yards	1	27	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Road Work	1	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	2	7	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Steel	6	19	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Conductor	18	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cleanup	24	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wreck-Out	1	5	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total			**0.3**	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Monthly Total			**54.4**	**93.7**	**93.7**	**93.7**	**93.7**	**72.2**	**72.2**	**23.5**	**23.5**	**23.5**	**23.5**	**23.5**	**23.5**
Maximum Daily Total (lb/day)			**93.7**												

Table 26-F (continued)
Transmission Line Segment 2 Construction Daily PM2.5 Emissions Summary

	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27
On-Site														
Equipment														
Marshalling Yards	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	3.6	3.6	3.6	3.6	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.9	1.9	1.9
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment Total	**5.9**	**5.9**	**5.9**	**5.9**	**10.5**	**10.5**	**6.9**	**6.9**	**6.9**	**6.9**	**8.8**	**8.8**	**8.8**	**4.3**
Motor Vehicle Exhaust														
Marshalling Yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicle Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.3**	**0.3**	**0.3**	**0.2**
Fugitive														
Marshalling Yards	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	9.4	9.4	9.4	9.4	9.4	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.1	14.1	14.1	14.1
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Total	**17.1**	**17.1**	**17.1**	**17.1**	**36.9**	**36.9**	**27.5**	**27.5**	**27.5**	**27.5**	**41.6**	**41.6**	**41.6**	**21.8**
On-Site Total	**23.1**	**23.1**	**23.1**	**23.1**	**47.5**	**47.5**	**34.5**	**34.5**	**34.5**	**34.5**	**50.7**	**50.7**	**50.7**	**26.3**
Off-Site Motor Vehicle Exhaust and Fugitive														
Marshalling Yards	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Road Work	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tower and Substation Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steel	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conductor	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Wreck-Out	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Total	**0.3**	**0.3**	**0.3**	**0.3**	**0.5**	**0.5**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.1**
Monthly Total	**23.5**	**23.5**	**23.5**	**23.5**	**48.0**	**48.0**	**34.8**	**34.8**	**34.8**	**34.8**	**51.0**	**51.0**	**51.0**	**26.4**

Note: Totals may not match sum of individual values because of rounding.

Air Quality

Attachment DR-95

Revised Emissions from Solar Array Maintenance Vehicles

Air Quality

Attachment DR-95

Revised Emissions from Solar Array Maintenance Vehicles

Table 19-A Motor Vehicle Combustion Criteria Pollutant Emissions (Revised April 2009)

Vehicle	Distance		Speed	CO	VOC	NOx	SOx	Exh. PM10	Fug. PM10	Diesel PM	Exh. PM2.5	Fug. PM2.5
	Miles/yr	Miles/day	Miles/hr	lb/hr								
Mirror Wash Truck	600	4.8	5	1.09E-02	2.20E-03	2.12E-02	2.11E-04	6.03E-04	2.73E+00	6.03E-04	6.03E-04	5.79E-01
Maintenance Vehicles	19200	76.8	10	1.20E-02	4.15E-04	9.19E-04	1.01E-04	1.01E-04	2.77E+00	0.00E+00	1.01E-04	5.88E-01
Weed Abatement	68	40	5	1.09E-02	2.20E-03	2.12E-02	2.11E-04	6.03E-04	2.73E+00	6.03E-04	6.03E-04	5.79E-01
Soil Stabilizer Application	68	40	5	1.09E-02	2.20E-03	2.12E-02	2.11E-04	6.03E-04	2.73E+00	6.03E-04	6.03E-04	5.79E-01
Total				**4.47E-02**	**7.02E-03**	**6.46E-02**	**7.34E-04**	**1.91E-03**	**1.10E+01**	**1.81E-03**	**1.91E-03**	**2.32E+00**
Vehicle	**Distance**		**Speed**	**CO**	**VOC**	**NOx**	**SOx**	**Exh. PM10**	**Fug. PM10**	**Diesel PM**	**Exh. PM2.5**	**Fug. PM2.5**
	Miles/yr	**Miles/day**	**Miles/hr**	**lb/day**								
Mirror Wash Truck	600	4.8	5	1.05E-02	2.11E-03	2.04E-02	2.03E-04	5.79E-04	2.62E+00	5.79E-04	5.79E-04	5.55E-01
Maintenance Vehicles	19200	76.8	10	9.24E-02	3.18E-03	7.06E-03	7.75E-04	7.75E-04	2.13E+01	0.00E+00	7.75E-04	4.52E+00
Weed Abatement	68	40	5	8.71E-02	1.76E-02	1.70E-01	1.69E-03	4.83E-03	2.18E+01	4.83E-03	4.83E-03	4.63E+00
Soil Stabilizer Application	68	40	5	8.71E-02	1.76E-02	1.70E-01	1.69E-03	4.83E-03	2.18E+01	4.83E-03	4.83E-03	4.63E+00
Total				**2.77E-01**	**4.05E-02**	**3.67E-01**	**4.36E-03**	**1.10E-02**	**6.76E+01**	**1.02E-02**	**1.10E-02**	**1.43E+01**
Vehicle	**Distance**		**Speed**	**CO**	**VOC**	**NOx**	**SOx**	**Exh. PM10**	**Fug. PM10**	**Diesel PM**	**Exh. PM2.5**	**Fug. PM2.5**
	Miles/yr	**Miles/day**	**Miles/hr**	**ton/yr**								
Mirror Wash Truck	600	4.8	5	6.53E-04	1.32E-04	1.27E-03	1.27E-05	3.62E-05	1.64E-01	3.62E-05	3.62E-05	3.47E-02
Maintenance Vehicles	19200	76.8	10	1.16E-02	3.98E-04	8.82E-04	9.68E-05	9.68E-05	2.66E+00	0.00E+00	9.68E-05	5.65E-01
Weed Abatement	68	40	5	7.41E-05	1.50E-05	1.44E-04	1.44E-06	4.10E-06	1.86E-02	4.10E-06	4.10E-06	3.93E-03
Soil Stabilizer Application	68	40	5	7.41E-05	1.50E-05	1.44E-04	1.44E-06	4.10E-06	1.86E-02	4.10E-06	4.10E-06	3.93E-03
Total				**1.24E-02**	**5.60E-04**	**2.45E-03**	**1.12E-04**	**1.41E-04**	**2.86E+00**	**4.44E-05**	**1.41E-04**	**6.07E-01**

Table 19-B 2011 Motor Vehicle Emission Factors (Revised April 2009)

Vehicle Use	Vehicle Type	Vehicle Class	Emission Factors								
			CO (lb/mi)	VOC (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	Exh. PM10 (lb/mi)	Fug. PM10 (lb/mi)	Diesel PM (lb/mi)	Exh. PM2.5 (lb/mi)	Fug. PM2.5 (lb/mi)
Mirror Wash Truck	Water Trucks, Freightliner 4000 gallon	HHDT-DSL	2.18E-03	4.40E-04	4.25E-03	4.22E-05	1.21E-04	5.46E-01	1.21E-04	1.21E-04	1.16E-01
Weed Abatement	Water Trucks, Freightliner 4000 gallon	HHDT-DSL	2.18E-03	4.40E-04	4.25E-03	4.22E-05	1.21E-04	5.46E-01	1.21E-04	1.21E-04	1.16E-01
Soil Stabilizer Application	Water Trucks, Freightliner 4000 gallon	HHDT-DSL	2.18E-03	4.40E-04	4.25E-03	4.22E-05	1.21E-04	5.46E-01	1.21E-04	1.21E-04	1.16E-01
Maintenance Vehicles	On-Site 3/4 Ton Pick-Up, Ford	LDT2-CAT	1.20E-03	4.15E-05	9.19E-05	1.01E-05	1.01E-05	2.77E-01	0.00E+00	1.01E-05	5.88E-02

Note: The emission factors, except fugitive emissions from entrained road dust, were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and dividing calculated daily emissions by daily vehicle-miles-traveled.
All vehicles were assumed to be 2011 model year.
All the emission factors account for the emissions from start, running and idling exhaust. In addition, the VOC emission factors take into account diurnal, hot soak, running and resting emissions.

Table 19-C Fugitive PM10 and PM2.5 Emission Factors

Vehicle Class	Vehicle Weight (tons)	Silt Content (%)	Control Eff. (%)	PM10 Emiss. Factor (lb/mi)	PM2.5 Emiss. Factor (lb/mi)
Water Trucks, Freightliner 4000 gallon	13.5	11	80	5.46E-01	1.16E-01
On-Site 3/4 Ton Pick-Up, Ford	3	11	80	2.77E-01	5.88E-02

PM2.5 fraction in unpaved road dust = 0.212 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emission Factor [lb/mi] = 1.5 x (silt content [%] / 12)$^{0.9}$ x (vehicle weight [tons] / 3)$^{0.45}$ x (1 - control efficiency [%] / 100)
Reference: AP-42, Section 13.2.2, December 2003 for industrial unpaved roads

Air Quality

Attachment DR-97

GHG Emissions Calculation Procedures and Detailed Calculations

Prepared for:
Inland Energy, Inc.

Palmdale Hybrid Power Project

Construction Greenhouse Gas Emissions Calculations

AECOM, Inc.
April 2009
Document No.: 10855-002-300CGHG

AECOM

Prepared for:
Inland Energy, Inc.

Palmdale Hybrid Power Project

Construction Greenhouse Gas Emissions Calculations

Steven L. Heisler

Russell Kingsley

Reviewed By Russ Kingsley

AECOM, Inc.
April 2009
Document No.: 10855-002-300CGHG

Contents

1.0 Introduction

This Document contains a description of greenhouse gas (GHG) emissions calculated for construction of the Palmdale Hybrid Power Project (PHPP, or Project). Section 2 describes the methodology used to calculate emissions, and references are provided in Section 3. Tables which contain the GHG emissions during construction of the PHPP follow in tables at the end of the document.

2.0 Construction Greenhouse Gas Emissions

GHG emissions will arise from the operation of construction equipment and motor vehicles. The Project will include construction of the combined cycle facility, the solar facility, the reclaimed water supply pipeline, the natural gas supply pipeline, the sewer line, the potable water supply pipeline, and the two segments of the electricity transmission line. GHG emissions during each month of construction were calculated separately for the combined cycle facility, the solar facility, the reclaimed water supply pipeline, the natural gas supply pipeline, the sewer line, and the potable water supply pipeline. The monthly emissions were summed over the construction duration for each Project component to calculate total GHG emissions. GHG emissions during each construction phase for each transmission line segment were also calculated. The emissions during the phases were summed to calculate total GHG emissions.

2.1 Emission Calculation Methodology

2.1.1 Construction Equipment Exhaust Emissions

The combustion of fuel to provide power for the operation of various construction activities and equipment results in the generation of GHG, including carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). The following predictive emission equation was used to calculate exhaust emissions from construction equipment:

$$\text{Exhaust Emissions}_{C,i,j}\,(MT) = EF_{C,i,j} \times F_{C,jk} \times T_{H,k} / 1000 \qquad \text{(Eq. 2-1)}$$

Where:

$EF_{C,i,j}$ = Emission factor for specific GHG i from construction equipment using fuel j (kg/gal)

$F_{C,jk}$ = Fuel consumption rate for fuel j in construction equipment of type k (gal/hr)

$T_{H,k}$ = Operating time for equipment of type k (hr)

1000 = kilograms per metric tonne (kg/MT)

The fuel consumption rates used for the calculations are composite horsepower-based off-road consumption rates for 2009 derived from the California Air Resources Board's (ARB) OFFROAD2007 Model (version 2.0.1.2, December 15, 2007) (ARB, 2007a). The OFFROAD2007 Model calculates total daily fuel consumption by equipment category (crane, dozer, grader, etc.) and type of fuel (diesel, gasoline, etc.) within engine horsepower ranges in a geographic area, such as the Antelope Valley Air Quality Management District (AVAQMD) jurisdiction. The model also calculates total daily operating hours within the geographic area by equipment category, fuel and horsepower range. The total daily fuel consumptions were divided by the total daily operating hours to calculate fuel consumption rates, in gallons per hour, by equipment category, fuel and horsepower range. The diesel off-road equipment fuel consumption rates for 2009, except for the 2006 model year scrapers to be used for site grading, are in Table 1 at the end of this document, and the gasoline off-road equipment consumption rates are in Table 2. Fuel consumption rates during 2009 for 2006 model year scrapers are in Table 3. Consumption rates for the specific types of equipment anticipated to be used during construction of the PHPP are in Table 4.

CO_2 emission factors, in units of kilograms per gallon (kg/gal), were taken directly from Table 4 in Appendix A of ARB (2008). CH_4 and N_2O emission factors, in units of grams per million British thermal units (g/MMBtu), were taken from Table 6 in Appendix A of ARB (2008). These emission factors were converted to units of kg/gal by the following equation:

$$EF_{C,ij}\ (kg/gal) = EFH_{C,ij} \times HHV_j / 42 / 1000 \qquad \text{(Eq. 2-2)}$$

Where:

$EFH_{C,ij}$ = Emission factor for GHG i from fuel j (g/MMBtu)

HHV_j = Higher heating value for fuel j (MMBtu/barrel)

42 = gallons per barrel

1000 = grams per kilogram (g/kg)

Higher heating values for diesel fuel and gasoline, in units of MMBtu/barrel, were taken from Table 4 in Appendix A of ARB (2008).

Construction equipment GHG emission factors are in Tables 7-A and 7-B at the end of this document.

2.1.2 Motor Vehicle Exhaust Emissions

The combustion of fuel in motor vehicle engines results in the generation of GHGs, including CO_2, CH_4 and N_2O. The following predictive emission equation was used to calculate CO_2 exhaust emissions from motor vehicles:

$$CO_2\ \text{Exhaust Emissions}_{V,j}\ (MT) = EF_{CO2V,j} \times F_{V,k} \times VMT_k / 1000 \qquad \text{(Eq. 2-3)}$$

Where:

$EF_{CO2V,j}$ = Emission factor for CO_2 from vehicles using fuel j (kg/gal)

$F_{V,k}$ = Fuel consumption rate for vehicle of type k (gal/mi)

VMT_k = Vehicle miles traveled by vehicles of type k (mi)

1000 = kilograms per metric tonne (kg/MT)

Fuel consumption rates were compiled by running the ARB's EMFAC2007 (version 2.3) Burden Model (ARB, 2007b) for the AVAQMD jurisdiction during calendar year 2009. Daily fuel use by vehicle class (light-duty truck, heavy, heavy-heavy duty diesel vehicle, etc.) from the Burden model were divided by the daily mileage traveled by vehicles within the class from the Burden Model to calculate the consumption rates. The motor vehicle fuel consumption rates from the Burden Model are listed in Table 5 at the end of this document, and the consumption rates for the vehicles to be used for construction of PHPP are listed in Table 6. CO_2 emission factors, in units of kilograms per gallon (kg/gal), were taken directly from Table 7 in Appendix A of ARB (2008).

CH_4 and N_2O emissions from motor vehicles were calculated from the following equation:

$$\text{Exhaust Emissions}_{V,ij}\,(MT) = EF_{ij} \times VMT_k / 1000000 \qquad \text{(Eq. 2-4)}$$

Where:

$EF_{V,ij}$ = Emission factor for GHG i from vehicles using fuel j (g/mi)

VMT_k = Vehicle miles traveled by vehicles of type k (mi)

1000000 = grams per metric tonne (g/MT)

CH_4 and N_2O emission factors, in units of grams per mile, were taken from Table 8 in Appendix A of ARB (2008).

Motor vehicle GHG emission factors are in Table 7-C at the end of this document.

2.2 Emission Calculations

Emissions were calculated from estimates of (1) the types, number, horsepower rating and daily operating hours for construction equipment; and (2) the types, number and daily miles traveled by on site and offsite motor vehicles. These estimates were made by construction month for construction of the combined cycle facility, the solar facility, the reclaimed water supply pipeline, the natural gas supply pipeline, the sewer line, and the potable water supply pipeline. The monthly emissions were summed over the construction duration for each Project component to calculate total GHG emissions. GHG emissions during each construction phase for each transmission line segment were also calculated. The emissions during the phases were summed to calculate total GHG emissions.

Calculations of combined cycle facility GHG construction emissions are in Tables 8-A through 8-F at the end of this document, calculations of solar facility construction GHG emissions are in Tables 9-A through 9-F, calculations of reclaimed water supply pipeline construction GHG emissions are in Tables 10-A through 10-F, calculations of natural gas supply pipeline construction GHG emissions are in Tables 11-A through 11F, calculations of sewer line construction GHG emissions are in Tables 12-A through 12-F, and calculations of potable water supply pipeline construction GHG emissions are in Tables 13-A through 13-F. Table A in each set of tables lists construction equipment emissions, Table B lists motor vehicle emissions, and Table C lists total emissions. Table D lists the daily operating hours for construction equipment, daily vehicle miles traveled for motor vehicles, and number of pieces of construction equipment and motor vehicles by month for each type of equipment or motor vehicle; Table E lists the monthly operating hours and vehicle miles traveled for each type of construction equipment or motor vehicle, based on 22 working days per month, and Table F lists the monthly fuel consumption for each type of construction equipment or motor vehicle.

Total emissions of each GHG are listed in Table C in each set of tables as well as the CO_2-equivalent (CO_2e) emissions of CH_4 and N_2O. CO_2e is a measure for comparing CO_2 with other GHGs, based on the quantity of those gases multiplied by the appropriate global warming potential (GWP). The GWP for CH_4 and N_2O were taken from Table 2 in Appendix A of ARB (2008) and are listed in Table C.

Calculations of transmission line segment 1 GHG construction emissions are in Tables 14-A through 14-D at the end of this document, and calculations of transmission line segment 2 GHG construction emissions are in Tables 15-A through 15-D. Table A in each set of tables lists construction equipment emissions, Table B lists motor vehicle emissions, and Table C lists total emissions. Table D lists, for each transmission line segment construction phase, the daily operating hours for construction equipment, daily vehicle miles traveled for motor vehicles, number of pieces of construction equipment and motor vehicles, the duration of each phase, operating hours and vehicle miles traveled for each type of construction equipment or motor vehicle, based on 22 working days per month or five working days per week, and fuel consumption for each type of construction equipment or motor vehicle.

Total calculated emissions during construction of the BSEP are summarized in Table 16.

3.0 References

ARB, 2007a. California Air Resources Board OFFROAD2007 Model, version 2.0.1.2, http://www.arb.ca.gov/msei/offroad/offroad.htm, December 15.

ARB, 2007b. California Air Resources Board EMFAC2007 (version 2.3) Burden Model available online at: http://www.arb.ca.gov/msei/onroad/latest_version.htm.

ARB, 2008. Second 15-Day Modified Regulatory Language for Public Comment, Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, available online at: http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf.

TABLES

Table 1
Diesel Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
Aerial Lifts	0	15	0.39
Aerial Lifts	16	25	0.50
Aerial Lifts	26	50	0.91
Aerial Lifts	51	120	1.74
Aerial Lifts	121	500	9.64
Aerial Lifts	501	750	17.43
Agricultural Mowers	0	120	1.61
Agricultural Tractors	0	15	0.48
Agricultural Tractors	16	25	0.92
Agricultural Tractors	26	50	1.60
Agricultural Tractors	51	120	3.34
Agricultural Tractors	121	175	5.69
Agricultural Tractors	176	250	8.08
Agricultural Tractors	251	500	13.22
Air Compressors	0	15	0.33
Air Compressors	16	25	0.66
Air Compressors	26	50	1.04
Air Compressors	51	120	2.15
Air Compressors	121	175	4.04
Air Compressors	176	250	5.95
Air Compressors	251	500	10.51
Air Compressors	501	750	16.24
Air Compressors	751	1000	22.10
Balers	0	50	1.68
Balers	51	120	2.49
Bore/Drill Rigs	0	15	0.47
Bore/Drill Rigs	16	25	0.73
Bore/Drill Rigs	26	50	1.43
Bore/Drill Rigs	51	120	3.52
Bore/Drill Rigs	121	175	6.42
Bore/Drill Rigs	176	250	8.51
Bore/Drill Rigs	251	500	14.07
Bore/Drill Rigs	501	750	27.81
Bore/Drill Rigs	751	1000	41.99
Cement and Mortar Mixers	0	15	0.29
Cement and Mortar Mixers	16	25	0.80
Chippers/Stump Grinders	0	25	0.92
Chippers/Stump Grinders	26	120	3.48
Chippers/Stump Grinders	121	175	6.01
Chippers/Stump Grinders	176	250	10.08
Chippers/Stump Grinders	251	500	11.20
Chippers/Stump Grinders	501	750	26.97
Chippers/Stump Grinders	751	1000	38.46
Combines	0	120	4.34

Table 1
Diesel Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
Combines	121	175	5.68
Combines	176	250	7.95
Combines	251	500	10.93
Commercial Turf Equipment	0	15	0.44
Commercial Turf Equipment	16	25	0.66
Compressor (Entertainment)	0	120	1.60
Compressor (Railyard)	0	120	1.49
Concrete/Industrial Saws	0	25	0.75
Concrete/Industrial Saws	26	50	1.41
Concrete/Industrial Saws	51	120	3.40
Concrete/Industrial Saws	121	175	7.31
Crane (Rail-CHE)	0	120	2.48
Crane (Rail-CHE)	121	175	3.12
Cranes	0	50	1.09
Cranes	51	120	2.30
Cranes	121	175	3.67
Cranes	176	250	5.10
Cranes	251	500	8.19
Cranes	501	750	13.78
Cranes	751	9999	44.19
Crawler Tractors	0	50	1.17
Crawler Tractors	51	120	3.03
Crawler Tractors	121	175	5.54
Crawler Tractors	176	250	7.56
Crawler Tractors	251	500	11.81
Crawler Tractors	501	750	21.17
Crawler Tractors	751	1000	30.02
Crushing/Proc. Equipment	0	50	2.07
Crushing/Proc. Equipment	51	120	3.82
Crushing/Proc. Equipment	121	175	7.64
Crushing/Proc. Equipment	176	250	11.09
Crushing/Proc. Equipment	251	500	16.95
Crushing/Proc. Equipment	501	750	26.71
Crushing/Proc. Equipment	751	9999	59.47
Dumpers/Tenders	0	25	0.35
Excavators	0	25	0.75
Excavators	26	50	1.17
Excavators	51	120	3.38
Excavators	121	175	5.13
Excavators	176	250	7.20
Excavators	251	500	10.60
Excavators	501	750	17.57
Forklifts	0	50	0.69
Forklifts	51	120	1.43

Table 1
Diesel Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
Forklifts	121	175	2.56
Forklifts	176	250	3.49
Forklifts	251	500	5.03
Generator (Entertainment)	0	50	2.02
Generator (Entertainment)	51	120	4.08
Generator (Entertainment)	121	175	6.81
Generator (Entertainment)	176	250	8.96
Generator (Entertainment)	251	500	12.54
Generator (Entertainment)	501	750	24.62
Generator (Entertainment)	751	9999	43.85
Generator (Railyard)	0	175	6.35
Generator (Railyard)	176	9999	39.93
Generator Sets	0	15	0.47
Generator Sets	16	25	0.81
Generator Sets	26	50	1.42
Generator Sets	51	120	3.57
Generator Sets	121	175	6.47
Generator Sets	176	250	9.63
Generator Sets	251	500	15.26
Generator Sets	501	750	24.64
Generator Sets	751	9999	47.61
Graders	0	50	1.29
Graders	51	120	3.44
Graders	121	175	5.66
Graders	176	250	7.81
Graders	251	500	10.42
Graders	501	750	22.06
Hydro Power Units	0	15	0.27
Hydro Power Units	16	25	0.52
Hydro Power Units	26	50	0.99
Hydro Power Units	51	120	1.93
Lawn & Garden Tractors	0	15	0.42
Lawn & Garden Tractors	16	25	0.65
Leaf Blowers/Vacuums	0	15	0.14
Leaf Blowers/Vacuums	16	120	2.22
Leaf Blowers/Vacuums	121	250	4.54
Materials Handling (Rail-CHE)	0	120	2.72
Off-Highway Tractors	0	120	4.32
Off-Highway Tractors	121	175	5.97
Off-Highway Tractors	176	250	5.94
Off-Highway Tractors	251	750	25.97
Off-Highway Tractors	751	1000	37.26
Off-Highway Trucks	0	175	5.72
Off-Highway Trucks	176	250	7.56

Table 1
Diesel Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
Off-Highway Trucks	251	500	12.36
Off-Highway Trucks	501	750	20.04
Off-Highway Trucks	751	1000	28.39
Other Agricultural Equipment	0	15	0.35
Other Agricultural Equipment	16	25	0.64
Other Agricultural Equipment	26	50	1.19
Other Agricultural Equipment	51	120	2.34
Other Agricultural Equipment	121	175	4.23
Other Agricultural Equipment	176	250	6.09
Other Agricultural Equipment	251	500	8.76
Other Construction Equipment	0	15	0.46
Other Construction Equipment	16	25	0.60
Other Construction Equipment	26	50	1.30
Other Construction Equipment	51	120	3.70
Other Construction Equipment	121	175	4.86
Other Construction Equipment	176	500	11.52
Other General Industrial Equipmen	0	15	0.29
Other General Industrial Equipmen	16	25	0.70
Other General Industrial Equipmen	26	50	1.02
Other General Industrial Equipmen	51	120	2.85
Other General Industrial Equipmen	121	175	4.38
Other General Industrial Equipmen	176	250	6.15
Other General Industrial Equipmen	251	500	12.04
Other General Industrial Equipmen	501	750	19.85
Other General Industrial Equipmen	751	1000	25.44
Other Lawn & Garden Equipment	0	15	0.56
Other Lawn & Garden Equipment	16	25	0.74
Other Material Handling Equipment	0	50	1.43
Other Material Handling Equipment	51	120	2.79
Other Material Handling Equipment	121	175	5.58
Other Material Handling Equipment	176	250	6.58
Other Material Handling Equipment	251	500	8.69
Other Material Handling Equipment	501	9999	33.71
Pavers	0	25	0.85
Pavers	26	50	1.32
Pavers	51	120	3.18
Pavers	121	175	5.87
Pavers	176	250	8.84
Pavers	251	500	10.63
Paving Equipment	0	25	0.57
Paving Equipment	26	50	1.13
Paving Equipment	51	120	2.51
Paving Equipment	121	175	4.62
Paving Equipment	176	250	5.56

Table 1
Diesel Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
Plate Compactors	0	15	0.20
Pressure Washers	0	15	0.22
Pressure Washers	16	25	0.33
Pressure Washers	26	50	0.66
Pressure Washers	51	120	1.10
Pumps	0	15	0.34
Pumps	16	25	0.89
Pumps	26	50	1.59
Pumps	51	120	3.57
Pumps	121	175	6.39
Pumps	176	250	9.12
Pumps	251	500	15.64
Pumps	501	750	25.86
Pumps	751	9999	61.53
Rollers	0	15	0.29
Rollers	16	25	0.61
Rollers	26	50	1.22
Rollers	51	120	2.71
Rollers	121	175	4.94
Rollers	176	250	6.95
Rollers	251	500	9.95
Rough Terrain Forklifts	0	50	1.59
Rough Terrain Forklifts	51	120	2.87
Rough Terrain Forklifts	121	175	5.70
Rough Terrain Forklifts	176	250	7.75
Rough Terrain Forklifts	251	500	11.64
Rubber Tired Dozers	0	175	5.93
Rubber Tired Dozers	176	250	8.36
Rubber Tired Dozers	251	500	12.12
Rubber Tired Dozers	501	750	18.24
Rubber Tired Dozers	751	1000	27.10
Rubber Tired Loaders	0	25	0.77
Rubber Tired Loaders	26	50	1.46
Rubber Tired Loaders	51	120	2.71
Rubber Tired Loaders	121	175	4.86
Rubber Tired Loaders	176	250	6.76
Rubber Tired Loaders	251	500	10.76
Rubber Tired Loaders	501	750	22.05
Rubber Tired Loaders	751	1000	27.01
Sailboat Auxiliary Inboard Engine	0	50	0.55
Scrapers	0	120	4.32
Scrapers	121	175	6.77
Scrapers	176	250	9.53
Scrapers	251	500	14.65

Table 1
Diesel Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
Scrapers	501	750	25.30
Signal Boards	0	15	0.28
Signal Boards	16	50	1.69
Signal Boards	51	120	3.68
Signal Boards	121	175	7.05
Signal Boards	176	250	11.57
Skid Steer Loaders	0	25	0.63
Skid Steer Loaders	26	50	1.18
Skid Steer Loaders	51	120	1.96
Sprayers	0	25	0.55
Sprayers	26	50	1.04
Sprayers	51	120	2.61
Sprayers	121	175	4.31
Sprayers	176	250	7.04
Sprayers	251	500	7.69
Surfacing Equipment	0	50	0.66
Surfacing Equipment	51	120	2.92
Surfacing Equipment	121	175	3.91
Surfacing Equipment	176	250	6.12
Surfacing Equipment	251	500	10.05
Surfacing Equipment	501	750	15.76
Swathers	0	120	2.46
Swathers	121	175	4.71
Sweepers/Scrubbers	0	15	0.54
Sweepers/Scrubbers	16	25	0.89
Sweepers/Scrubbers	26	50	1.48
Sweepers/Scrubbers	51	120	3.44
Sweepers/Scrubbers	121	175	6.34
Sweepers/Scrubbers	176	250	7.34
Tillers	0	15	0.31
Tillers	16	250	10.86
Tillers	251	500	19.36
Tractors/Loaders/Backhoes	0	25	0.72
Tractors/Loaders/Backhoes	26	50	1.42
Tractors/Loaders/Backhoes	51	120	2.37
Tractors/Loaders/Backhoes	121	175	4.63
Tractors/Loaders/Backhoes	176	250	7.78
Tractors/Loaders/Backhoes	251	500	15.63
Tractors/Loaders/Backhoes	501	750	23.44
Transport Refrigeration Units	0	15	0.37
Transport Refrigeration Units	16	25	0.62
Transport Refrigeration Units	26	50	1.20
Trenchers	0	15	0.39
Trenchers	16	25	1.50

Table 1
Diesel Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
Trenchers	26	50	1.55
Trenchers	51	120	2.98
Trenchers	121	175	6.58
Trenchers	176	250	10.14
Trenchers	251	500	14.20
Trenchers	501	750	26.76
Vessels w/Inboard Engines	0	250	4.99
Welders	0	15	0.28
Welders	16	25	0.52
Welders	26	50	1.21
Welders	51	120	1.81
Welders	121	175	4.48
Welders	176	250	5.40
Welders	251	500	7.60

[a] These are composite horsepower-based fuel consumption rates for 2009 developed by running CARB's OFFROAD2007 Model (December 15, 2006 version).
Total daily fuel consumption from the model for each type of equipment within each horsepower range was divided by the total daily operating hours for the equipment within each horsepower range to calculate hourly fuel consumption from individual pieces of equipment.

Table 2
Four-stroke Gasoline Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
2-Wheel Tractors	0	5	0.21
2-Wheel Tractors	6	15	0.48
2-Wheel Tractors	16	25	1.00
Aerial Lifts	0	15	0.58
Aerial Lifts	16	25	0.88
Aerial Lifts	26	50	1.60
Aerial Lifts	51	120	2.91
Agricultural Mowers	0	15	0.39
Agricultural Mowers	16	25	0.90
Agricultural Tractors	0	120	5.04
Agricultural Tractors	121	175	7.09
Air Compressors	0	5	0.22
Air Compressors	0	5	0.22
Air Compressors	6	15	0.38
Air Compressors	6	15	0.38
Air Compressors	16	25	0.96
Air Compressors	16	25	0.96
Air Compressors	26	50	2.17
Air Compressors	51	120	3.84
Air Compressors	121	175	6.85
All Terrain Vehicles (ATVs) Active	0	15	0.02
All Terrain Vehicles (ATVs) Active	16	25	0.02
All Terrain Vehicles (ATVs) Active	26	50	0.02
All Terrain Vehicles (ATVs) Inactive	0	15	0.00
All Terrain Vehicles (ATVs) Inactive	16	25	0.00
All Terrain Vehicles (ATVs) Inactive	26	50	0.00
Asphalt Pavers	0	15	0.58
Asphalt Pavers	16	25	1.46
Asphalt Pavers	26	50	2.33
Asphalt Pavers	51	120	3.95
Balers	0	50	2.03
Balers	51	120	3.37
Bore/Drill Rigs	0	15	0.79
Bore/Drill Rigs	16	25	1.45
Bore/Drill Rigs	26	50	2.68
Bore/Drill Rigs	51	120	6.67
Bore/Drill Rigs	121	175	9.04
Cement and Mortar Mixers	0	5	0.25
Cement and Mortar Mixers	6	15	0.51
Cement and Mortar Mixers	16	25	1.60
Chippers/Stump Grinders	0	15	0.85
Chippers/Stump Grinders	0	15	0.91
Chippers/Stump Grinders	16	25	1.43
Chippers/Stump Grinders	16	25	1.51
Combines	0	120	7.16

Table 2
Four-stroke Gasoline Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
Combines	121	175	11.01
Combines	176	250	12.66
Commercial Turf Equipment	0	15	0.54
Commercial Turf Equipment	16	25	0.96
Commercial Turf Equipment	26	50	1.62
Commercial Turf Equipment	51	120	2.45
Concrete/Industrial Saws	0	5	0.27
Concrete/Industrial Saws	6	15	0.68
Concrete/Industrial Saws	16	25	1.33
Concrete/Industrial Saws	26	50	2.77
Concrete/Industrial Saws	51	120	4.71
Cranes	0	50	1.93
Cranes	51	120	3.41
Cranes	121	175	5.36
Crushing/Proc. Equipment	0	15	0.75
Crushing/Proc. Equipment	16	25	1.37
Crushing/Proc. Equipment	26	120	7.91
Dumpers/Tenders	0	5	0.13
Dumpers/Tenders	6	15	0.40
Dumpers/Tenders	16	25	0.84
Dumpers/Tenders	26	120	2.60
Forklifts	0	25	0.69
Forklifts	26	50	1.59
Forklifts	51	120	2.11
Forklifts	121	175	4.03
Front Mowers	0	15	0.53
Front Mowers	0	15	0.54
Front Mowers	16	25	0.71
Front Mowers	16	25	0.73
Generator Sets	0	5	0.27
Generator Sets	0	5	0.29
Generator Sets	6	15	0.63
Generator Sets	6	15	0.66
Generator Sets	16	25	1.34
Generator Sets	16	25	1.38
Generator Sets	26	50	2.29
Generator Sets	51	120	5.38
Generator Sets	121	175	9.00
Golf Carts	0	15	0.50
Hydro Power Units	0	5	0.23
Hydro Power Units	6	15	0.44
Hydro Power Units	16	25	0.96
Hydro Power Units	26	50	2.21
Hydro Power Units	51	120	3.38
Lawn & Garden Tractors	0	15	0.63

Table 2
Four-stroke Gasoline Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Fuel Consumption (gal/hr)
	From	To	
Lawn & Garden Tractors	0	15	0.65
Lawn & Garden Tractors	16	25	1.01
Lawn & Garden Tractors	16	25	1.03
Lawn & Garden Tractors	26	50	1.57
Lawn Mowers	0	5	0.12
Lawn Mowers	0	5	0.15
Leaf Blowers/Vacuums	0	5	0.07
Leaf Blowers/Vacuums	0	5	0.08
Minibikes	0	5	0.23
Off-Road Motorcycles Active	0	15	0.02
Off-Road Motorcycles Active	16	25	0.02
Off-Road Motorcycles Active	26	50	0.02
Off-Road Motorcycles Inactive	0	15	0.00
Off-Road Motorcycles Inactive	16	25	0.00
Off-Road Motorcycles Inactive	26	50	0.00
Other Agricultural Equipment	0	5	0.18
Other Agricultural Equipment	6	15	0.57
Other Agricultural Equipment	16	25	1.44
Other Agricultural Equipment	26	50	1.70
Other Agricultural Equipment	51	120	3.55
Other Agricultural Equipment	121	175	6.80
Other Agricultural Equipment	176	250	11.96
Other Construction Equipment	0	175	5.49
Other General Industrial Equipmen	0	15	0.42
Other General Industrial Equipmen	16	25	0.97
Other General Industrial Equipmen	26	50	1.80
Other General Industrial Equipmen	51	120	4.06
Other General Industrial Equipmen	121	175	8.56
Other Lawn & Garden Equipment	0	5	0.21
Other Lawn & Garden Equipment	0	5	0.26
Other Lawn & Garden Equipment	6	15	0.45
Other Lawn & Garden Equipment	6	15	0.47
Other Lawn & Garden Equipment	16	25	0.98
Other Lawn & Garden Equipment	16	25	1.03
Other Lawn & Garden Equipment	26	50	2.17
Other Lawn & Garden Equipment	51	120	5.61
Other Material Handling Equipment	0	50	2.40
Other Material Handling Equipment	51	120	2.78
Paving Equipment	0	5	0.20
Paving Equipment	6	15	0.58
Paving Equipment	16	25	1.32
Paving Equipment	26	50	2.31
Paving Equipment	51	120	3.73
Plate Compactors	0	5	0.18
Plate Compactors	6	15	0.44

Table 2
Four-stroke Gasoline Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range From	HP Range To	Fuel Consumption (gal/hr)
Pressure Washers	0	5	0.39
Pressure Washers	0	5	0.44
Pressure Washers	6	15	0.61
Pressure Washers	6	15	0.64
Pressure Washers	16	25	1.57
Pressure Washers	16	25	1.63
Pressure Washers	26	50	2.59
Pumps	0	5	0.18
Pumps	0	5	0.21
Pumps	6	15	0.55
Pumps	6	15	0.58
Pumps	16	25	1.19
Pumps	16	25	1.21
Pumps	26	50	2.27
Pumps	51	120	6.15
Pumps	121	175	9.03
Rear Engine Riding Mowers	0	15	0.33
Rear Engine Riding Mowers	0	15	0.34
Rear Engine Riding Mowers	16	25	0.64
Rear Engine Riding Mowers	16	25	0.66
Rollers	0	5	0.27
Rollers	6	15	0.54
Rollers	16	25	1.18
Rollers	26	50	2.62
Rollers	51	120	4.63
Rough Terrain Forklifts	0	50	3.28
Rough Terrain Forklifts	51	120	5.26
Rough Terrain Forklifts	121	175	8.17
Rubber Tired Loaders	0	50	2.43
Rubber Tired Loaders	51	120	3.85
Sailboat Auxiliary Inboard Engine	0	15	0.41
Shredders	0	5	0.27
Shredders	0	5	0.36
Signal Boards	0	5	0.32
Signal Boards	6	15	0.59
Skid Steer Loaders	0	15	0.79
Skid Steer Loaders	16	25	1.11
Skid Steer Loaders	26	50	1.93
Skid Steer Loaders	51	120	4.34
Specialty Vehicles Carts	0	5	0.26
Specialty Vehicles Carts	6	15	0.39
Specialty Vehicles Carts	16	25	1.09
Sprayers	0	5	0.17
Sprayers	6	15	0.39
Sprayers	16	25	0.93

Table 2
Four-stroke Gasoline Off-road Equipment Fuel Consumption for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Fuel Consumption (gal/hr)
	From	To	
Sprayers	26	50	1.74
Sprayers	51	120	3.26
Sprayers	121	175	6.35
Surfacing Equipment	0	5	0.20
Surfacing Equipment	6	15	0.38
Surfacing Equipment	16	25	0.94
Swathers	0	120	4.39
Swathers	121	175	6.09
Sweepers/Scrubbers	0	15	0.55
Sweepers/Scrubbers	16	25	1.28
Sweepers/Scrubbers	26	50	2.64
Sweepers/Scrubbers	51	120	4.51
Sweepers/Scrubbers	121	175	9.02
Tampers/Rammers	0	15	0.50
Tillers	0	5	0.14
Tillers	0	5	0.17
Tillers	6	15	0.54
Tractors/Loaders/Backhoes	0	120	2.98
Transport Refrigeration Units	0	15	0.58
Trenchers	0	15	0.64
Trenchers	16	25	1.39
Trenchers	26	50	2.19
Trenchers	51	120	4.27
Trimmers/Edgers/Brush Cutters	0	5	0.03
Trimmers/Edgers/Brush Cutters	0	5	0.04
Vessels w/Inboard Engines	0	250	5.62
Vessels w/Inboard Jet Engines	0	500	6.70
Vessels w/Outboard Engines	0	50	1.33
Vessels w/Sterndrive Engines	0	250	4.16
Welders	0	15	0.60
Welders	16	25	0.91
Welders	26	50	2.45
Welders	51	120	3.43
Welders	121	175	6.02
Wood Splitters	0	5	0.29
Wood Splitters	0	5	0.38

[a] These are composite horsepower-based fuel consumption rates for 2009 developed by running CARB's OFFROAD2007 Model (December 15, 2006 version). Total daily fuel consumption from the model for each type of equipment within each horsepower range was divided by the total daily operating hours for the equipment within each horsepower range to calculate hourly fuel consumption from individual pieces of equipment.

Table 3
Diesel Off-road 2006 Model Year Scraper Fuel Use for 2009 in Antelope Valley AQMD Jurisdiction by Equipment Catgeory and Horsepower Range[a]

Equipment Type	HP Range		Fuel Consumption (gal/hr)
	From	To	
Scrapers	0	175	6.71
Scrapers	176	250	9.48
Scrapers	251	500	14.52
Scrapers	501	750	25.11

[a] These are composite horsepower-based off-road fuel use rates for 2006 model year during 2009 developed by running CARB's OFFROAD2007 Model December 15, 2006 version) and specifying output by model year.
Total daily fuel use within each horsepower range was divided by the
total daily operating hours for the equipment within each horsepower range to calculate hourly fuel consumption by individual pieces of equipment.

Table 4
Construction Equipment Fuel Consumption

Equipment Type	Fuel	Horsepower	ARB Off-Road Model Category	Fuel Use (gal/hr)[a]
Air Compressor, Ingersoll-Rand	Diesel	80	Air Compressors	2.15
Asphalt Paver, Cat A-8008	Diesel	102	Pavers	3.18
Backhoe	Diesel	48	Tractors/Loaders/Backhoes	1.42
Backhoe, Cat, 420E	Diesel	89	Tractors/Loaders/Backhoes	2.37
Compactor, Cat CS-563	Diesel	145	Rollers	4.94
Compressor, 250 cfm	Diesel	80	Air Compressors	2.15
Crane, 150-Ton, Manitowoc	Diesel	250	Cranes	5.10
Crane, 20-Ton, TR400	Diesel	185	Cranes	5.10
Crane, 225-Ton, Manitowoc, 4100W	Diesel	350	Cranes	8.19
Crane, 40-Ton, Grove, TR700B	Diesel	220	Cranes	5.10
Crane, 5 ton	Diesel	62	Cranes	2.30
Dozer	Diesel	200	Crawler Tractors	7.56
Scraper, CAT 657G, Tractor Engine	Diesel	564	Scrapers	25.11
Scraper, CAT 657G, Scraper Engine	Diesel	410	Scrapers	14.52
Loader, Cat, 938F	Diesel	140	Rubber Tired Loaders	4.86
Motor Grader, Cat 135H	Diesel	135	Graders	5.66
Pipelayer, Cat 561N	Diesel	123	Cranes	3.67
Roller, 5 ton	Diesel	70	Rollers	2.71
Tractor/Loader/Backhoe	Diesel	80	Tractors/Loaders/Backhoes	2.37
Trencher, Cat 140G	Diesel	54	Trenchers	2.98
Truck, Concrete Pump, International	Diesel	190	Off-Highway Trucks	7.56
Vibratory Compactor	Diesel	70	Rollers	2.71
Welder	Diesel	35	Welders	1.21
Welder, Multiquip, BLW-300SS	Diesel	23	Welders	0.52
Welder, Multiquip, GA 3800	Gasoline	7.5	Welders	0.60
On-Site Watering Truck	Diesel	250	Off-Highway Trucks	7.56
Backhoe, w/Bucket	Diesel	85	Tractors/Loaders/Backhoes	2.37
Compressor	Gasoline	20	Air Compressors	0.96
Concrete Pumper	Diesel	85	Other Construction Equipment	3.70
Crane, Hydraulic, 150 Ton	Diesel	250	Cranes	5.10
Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	125	Cranes	3.67
Crane, Hydraulic, Rough Terrain, 35 Ton	Diesel	150	Cranes	3.67
Crawler, Track Type, Drill Rig, Pneumatic	Diesel	305	Crawler Tractors	11.81
Crawler, Track Type, Sagging (D8 type)	Diesel	305	Crawler Tractors	11.81
Crawler, Track Type, w/ Blade (D6 type)	Diesel	165	Crawler Tractors	5.54
Crawler, Track Type, w/ Blade (D8 type)	Diesel	305	Crawler Tractors	11.81
Digger, Transmission Type, Truck Mount	Diesel	190	Trenchers	10.14
Drill Rig, Truck Mount	Diesel	190	Bore/Drill Rigs	8.51
Forklift, 10 Ton	Diesel	85	Forklifts	1.43
Forklift, 5 Ton	Diesel	75	Forklifts	1.43
Loader, Front End, w/ Bucket	Diesel	145	Rubber Tired Loaders	4.86
Motor Grader	Diesel	110	Graders	3.44
Generator	Gasoline	5	Generator Sets	0.29
Tension Machine	Diesel	135	Other Construction Equipment	4.86
Truck, Flatbed w/Boom, 5 Ton	Diesel	235	Cranes	5.10
Truck, Boom	Diesel	310	Cranes	8.19
Truck, Flatbed, w/ Bucket, 5 Ton	Diesel	235	Cranes	5.10
Truck, Manlift	Diesel	235	Cranes	5.10
Truck, Wire Puller, 1 Drum	Diesel	310	Other Construction Equipment	11.52
Truck, Wire Puller, 1 Drum (OVHD Gr. Wr.)	Diesel	310	Other Construction Equipment	11.52
Truck, Wire Puller, 3 Drum	Diesel	310	Other Construction Equipment	11.52

[a] From Table 1 for diesel and Table 2 for gasoline for all except scrapers. Scrapers are from Table 3 and are for 2006 model year.

Table 5

Antelope Valley AQMD Jurisdiction 2009 On-Road Motor Vehicle Fuel Consumption

Vehicle Class	Fuel Consumption (gal/mi)[a]
LDA-NCAT	0.0761
LDA-CAT	0.0424
LDA-DSL	0.0363
LDT1-NCAT	0.0732
LDT1-CAT	0.0523
LDT1-DSL	0.0344
LDT2-NCAT	0.0750
LDT2-CAT	0.0525
LDT2-DSL	0.0325
MDV-NCAT	0.1025
MDV-CAT	0.0716
MDV-DSL	0.0325
LHDT1-NCAT	0.1000
LHDT1-CAT	0.0702
LHDT1-DSL	0.0519
LHDT2-CAT	0.0688
LHDT2-DSL	0.0520
MHDT-CAT	0.0720
MHDT-DSL	0.1512
HHDT-CAT	0.0767
HHDT-DSL	0.1825
OBUS-CAT	0.0775
OBUS-DSL	0.1475
SBUS-CAT	0.1000
SBUS-DSL	0.1520
UB-CAT	0.1000
UB-DSL	0.2614
MH-NCAT	0.0850
MH-CAT	0.0668
MH-DSL	0.1480
MCY-NCAT	0.0266
MCY-CAT	0.0248

[a] Fuel consumption calculated by dividing total fuel use [gal/day] from BURDEN output of EMFAC2007, version 2.3, by total VMT [mi/day] from BURDEN output.

Table 6
2009 Motor Vehicle Fuel Consumption

Vehicle Type	Vehicle Class	Fuel Consumption (gal/mi)[a]
On-Site Welding Truck	MDV-CAT	0.0716
On-Site Fuel/Lube Truck	MDV-CAT	0.0716
On-Site Flatbed Truck	MHDT-CAT	0.0720
On-Site Flatbed Truck, 2 Ton	MHDT-CAT	0.0720
On-Site Flatbed Truck, 5 Ton	MHDT-CAT	0.0720
On-Site Mechanics Truck	HHDT-DSL	0.1825
On-Site Watering Truck	HHDT-DSL	0.1825
On-Site Dump Truck	HHDT-DSL	0.1825
On-Site Pickup Truck	LDT1-CAT	0.0523
On-Site Cement Trucks	HHDT-DSL	0.1825
On-Site Semi Tractor	HHDT-DSL	0.1825
Off-Site Flat Bed Trucks	MDV-CAT	0.0716
Off-Site Asphalt Trucks	HHDT-DSL	0.1825
Off-Site Cement Trucks	HHDT-DSL	0.1825
Off-Site Construction Worker Commute	LDT1-CAT	0.0523
Off-Site Dump Trucks	HHDT-DSL	0.1825
Off-Site Low Boy Trucks	HHDT-DSL	0.1825
Off-Site Pickup Trucks	LDT1-CAT	0.0523
Off-Site Pipe Hauling Trucks	HHDT-DSL	0.1825
Off-Site Water Trucks	HHDT-DSL	0.1825
Off-Site Tractor-Trailer	HHDT-DSL	0.1825
Off-Site Fuel/Lube Trucks	MDV-CAT	0.0716

[a] From Table 5

Table 7-A
Construction Equipment Greenhouse Gas Emission Factors

Fuel	Emission Factors (kg/gallon)		
	CO_2[a]	CH_4[b]	N_2O[b]
Diesel	1.01E+01	4.16E-04	8.32E-05
Gasoline	8.80E+00	3.73E-04	7.45E-05

[a] From Table 4 , Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

[b] See Table 6-B for calculations

Table 7-B
Construction Equipment CH_4 and N_2O Emission Factors

Fuel	Heat Content (MMBtu/ barrel)[a]	CH_4		N_2O	
		Emission Factor (g/MMBtu)[b]	Emission Factor (kg/gallon)[c]	Emission Factor (g/MMBtu)[b]	Emission Factor (kg/gallon)[c]
Diesel	5.825	3	4.16E-04	0.6	8.32E-05
Gasoline	5.218	3	3.73E-04	0.6	7.45E-05

[a] From Table 4, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

[b] From Table 6, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

[c] Emission factor [Kg/gal] = Emission factor [g/MMBtu] x Heat content [MMBtu/barrel] / 42 [gal/barrel] x 0.001 [Kg/g]

Table 7-C
Motor Vehicle Greenhouse Gas Emission Factors

	Emission Factors[a]		
Fuel	**CO_2 (kg/gal)**	**CH_4 (g/mi)**	**N_2O (g/mi)**
Diesel	9.96E+00	5.10E-03	4.80E-03
Gasoline	8.55E+00	1.50E-02	1.00E-02

[a] From Table 7 (CO_2) and Table 8 (CH_4 and N_2O), Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

Table 8-A

Combined Cycle Facility Construction Construction Equipment Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)[a]	CH_4 Emission Factor (kg/gallon)	CH_4 Emissions (MT)[a]	N_2O Emission Factor (kg/gallon)	N_2O Emissions (MT)[a]
Construction Equipment Diesel	173,165	1.01E+01	1,756	4.16E-04	0.07	8.32E-05	0.01
Construction Equipment Gasoline	17,750	8.80E+00	156	3.73E-04	0.01	7.45E-05	0.00
Total			**1,912**		**0**		**0**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Table 8-B

Combined Cycle Facility Construction Motor Vehicle Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	Total VMT (miles)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)	CH_4 Emission Factor (g/mi)	CH_4 Emissions (MT)	N_2O Emission Factor (g/mi)	N_2O Emissions (MT)
Motor Vehicle Diesel	51,444	281,842	9.96E+00	512	5.10E-03	0.00	4.80E-03	0.00
Motor Vehicle Gasoline	372,424	7,065,850	8.55E+00	3,184	1.50E-02	0.11	1.00E-02	0.07
Total				**3,697**		**0.11**		**0.07**

Table 8-C

Combined Cycle Facility Construction Greenhouse Gas Emissions Summary

Item	CO_2	CH_4	N_2O
Emissions (MT)	5,609	0.19	0.09
Global Warming Potential[a]	1	21	310
Emissions (MT CO_2e)	5,609	4	27
Total Emissions (MT CO_2e)	**5,640**		

[a] From Table 2, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

Table 8-D
Combined Cycle Facility Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number													
			Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	4.5	4	4	4	4	4	4	4	5	5	5	5	5	5	5
Asphalt Paver, Cat A-8008	Diesel	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	5	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Compactor, Cat CS-563	Diesel	5	1	1	1	1	1	0	0	0	0	0	0	0	0	0
Crane, 150-Ton, Manitowoc	Diesel	4	0	0	0	0	1	1	2	2	2	2	2	2	1	1
Crane, 20-Ton, TR400	Diesel	5	0	0	0	1	1	1	1	1	2	2	2	2	2	2
Crane, 225-Ton, Manitowoc, 4100W	Diesel	4	0	0	0	0	0	0	0	1	1	1	1	2	2	2
Crane, 40-Ton, Grove, TR700B	Diesel	5	0	0	1	1	1	2	2	2	2	2	2	3	3	4
Loader, Cat, 938F	Diesel	5	1	1	1	1	1	1	1	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trencher, Cat 140G	Diesel	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Truck, Concrete Pump, International	Diesel	4	1	2	2	2	2	2	2	1	1	1	1	1	1	1
Welder, Multiquip, BLW-300SS	Diesel	6	1	1	1	2	3	6	9	9	9	9	9	9	8	7
Welder, Multiquip, GA 3800	Gasoline	6.5	5	5	5	5	7	7	7	7	7	7	8	9	9	9
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	Gasoline	5	2	2	2	2	2	2	2	2	2	2	3	3	3	3
On-Site Fuel/Lube Truck	Gasoline	5	1	1	1	1	1	1	1	1	1	2	2	2	2	2
On-Site Flatbed Truck	Gasoline	5	2	2	2	2	2	2	2	2	3	3	3	3	3	3
On-Site Watering Truck	Diesel	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1
On-Site Dump Truck	Diesel	5	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	20	4	4	4	4	4	9	9	15	15	20	20	20	15	15
Off-Site Asphalt Trucks	Diesel	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Cement Trucks	Diesel	20	0	0	5	5	5	5	5	6	6	3	1	1	1	1
Off-Site Construction Worker Commute	Gasoline	60	129	148	167	185	204	252	263	267	269	272	272	285	272	259
Off-Site Dump Trucks	Diesel	40	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Low Boy Trucks	Diesel	15	0	0	0	0	5	5	5	5	5	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	20	5	5	5	5	5	5	7	12	12	10	10	10	10	10
Off-Site Pipe Hauling Trucks	Diesel	120	0	0	0	0	0	4	4	8	8	8	8	4	4	4
Off-Site Water Trucks	Diesel	5	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Off-Site Fuel/Lube Trucks	Gasoline	20	2	2	2	2	2	3	3	3	3	3	3	3	3	3

Table 8-D (continued)
Combined Cycle Facility Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number												
			Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment															
Air Compressor, Ingersoll-Rand	Diesel	4.5	5	5	5	5	6	6	6	6	6	6	6	6	0
Asphalt Paver, Cat A-8008	Diesel	6	0	0	0	0	0	0	0	2	2	2	2	2	0
Backhoe, Cat, 420E	Diesel	5	1	1	1	1	1	1	1	1	0	0	0	0	0
Compactor, Cat CS-563	Diesel	5	0	0	0	0	0	0	1	1	1	1	1	1	0
Crane, 150-Ton, Manitowoc	Diesel	4	1	1	1	1	1	1	1	1	1	1	0	0	0
Crane, 20-Ton, TR400	Diesel	5	2	2	2	2	2	2	2	2	2	2	2	2	2
Crane, 225-Ton, Manitowoc, 4100W	Diesel	4	2	1	1	1	1	1	1	0	0	0	0	0	0
Crane, 40-Ton, Grove, TR700B	Diesel	5	4	2	2	2	2	2	2	2	2	2	2	2	2
Loader, Cat, 938F	Diesel	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	6	1	1	1	0	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	6	1	1	1	1	1	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	4	1	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	6	6	6	6	6	5	5	5	5	5	5	5	5	5
Welder, Multiquip, GA 3800	Gasoline	6.5	9	9	9	9	9	9	9	8	8	8	8	8	8
Motor Vehicles															
On-site Vehicles															
On-Site Welding Truck	Gasoline	5	3	3	3	3	3	3	3	3	3	3	3	3	3
On-Site Fuel/Lube Truck	Gasoline	5	2	2	2	2	2	2	2	1	1	1	1	1	1
On-Site Flatbed Truck	Gasoline	5	3	3	3	3	3	3	3	3	3	3	3	3	3
On-Site Watering Truck	Diesel	8	1	1	1	1	1	1	1	1	1	1	1	1	1
On-Site Dump Truck	Diesel	5	2	2	2	2	1	1	1	1	1	1	1	1	1
Off-Site Vehicles															
Off-Site Flat Bed Trucks	Gasoline	20	10	10	10	5	5	1	1	1	1	1	1	1	1
Off-Site Asphalt Trucks	Diesel	20	0	0	0	0	0	0	0	2	2	2	2	2	2
Off-Site Cement Trucks	Diesel	20	1	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	60	227	210	184	181	167	166	152	126	118	106	105	104	99
Off-Site Dump Trucks	Diesel	40	2	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Low Boy Trucks	Diesel	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	20	10	5	5	5	5	5	5	5	5	5	3	3	3
Off-Site Pipe Hauling Trucks	Diesel	120	4	4	4	4	1	1	1	0	0	0	0	0	0
Off-Site Water Trucks	Diesel	5	2	2	2	2	2	2	2	1	1	1	1	1	1
Off-Site Fuel/Lube Trucks	Gasoline	20	3	3	2	2	2	2	2	2	2	2	2	2	2

Table 8-E

Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	396	396	396	396	396	396	396	495	495	495	495	495	495	495	495
Asphalt Paver, Cat A-8008	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	220	220	220	220	220	220	220	220	220	220	110	110	110	110	110
Compactor, Cat CS-563	Diesel	110	110	110	110	110	0	0	0	0	0	0	0	0	0	0
Crane, 150-Ton, Manitowoc	Diesel	0	0	0	0	88	88	176	176	176	176	176	176	88	88	88
Crane, 20-Ton, TR400	Diesel	0	0	0	110	110	110	110	110	220	220	220	220	220	220	220
Crane, 225-Ton, Manitowoc, 4100W	Diesel	0	0	0	0	0	0	0	88	88	88	88	176	176	176	176
Crane, 40-Ton, Grove, TR700B	Diesel	0	0	110	110	110	220	220	220	220	220	220	330	330	440	440
Loader, Cat, 938F	Diesel	110	110	110	110	110	110	110	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Trencher, Cat 140G	Diesel	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132
Truck, Concrete Pump, International	Diesel	88	176	176	176	176	176	176	88	88	88	88	88	88	88	88
Welder, Multiquip, BLW-300SS	Diesel	132	132	132	264	396	792	1,188	1,188	1,188	1,188	1,188	1,188	1,056	924	792
Welder, Multiquip, GA 3800	Gasoline	715	715	715	715	1,001	1,001	1,001	1,001	1,001	1,001	1,144	1,287	1,287	1,287	1,287
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	Gasoline	220	220	220	220	220	220	220	220	220	220	330	330	330	330	330
On-Site Fuel/Lube Truck	Gasoline	110	110	110	110	110	110	110	110	110	220	220	220	220	220	220
On-Site Flatbed Truck	Gasoline	220	220	220	220	220	220	220	220	330	330	330	330	330	330	330
On-Site Watering Truck	Diesel	176	176	176	176	176	176	176	176	176	176	176	176	176	176	176
On-Site Dump Truck	Diesel	110	110	110	110	110	220	220	220	220	220	220	220	220	220	220
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	1,760	1,760	1,760	1,760	1,760	3,960	3,960	6,600	6,600	8,800	8,800	8,800	6,600	6,600	4,400
Off-Site Asphalt Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Cement Trucks	Diesel	0	0	2,200	2,200	2,200	2,200	2,200	2,640	2,640	1,320	440	440	440	440	440
Off-Site Construction Worker Commute	Gasoline	170,280	195,360	220,440	244,200	269,280	332,640	347,160	352,440	355,080	359,040	359,040	376,200	359,040	341,880	299,640
Off-Site Dump Trucks	Diesel	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760
Off-Site Low Boy Trucks	Diesel	0	0	0	0	1,650	1,650	1,650	1,650	1,650	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	2,200	2,200	2,200	2,200	2,200	2,200	3,080	5,280	5,280	4,400	4,400	4,400	4,400	4,400	4,400
Off-Site Pipe Hauling Trucks	Diesel	0	0	0	0	0	10,560	10,560	21,120	21,120	21,120	21,120	10,560	10,560	10,560	10,560
Off-Site Water Trucks	Diesel	110	110	110	110	110	110	110	110	220	220	220	220	220	220	220
Off-Site Fuel/Lube Trucks	Gasoline	880	880	880	880	880	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320
Motor Vehicle Diesel		**2,156**	**2,156**	**4,356**	**4,356**	**6,006**	**16,676**	**16,676**	**27,676**	**27,786**	**24,816**	**23,936**	**13,376**	**13,376**	**13,376**	**13,376**
Motor Vehicle Gasoline		**175,670**	**200,750**	**225,830**	**249,590**	**274,670**	**340,670**	**356,070**	**366,190**	**368,940**	**374,330**	**374,440**	**391,600**	**372,240**	**355,080**	**310,640**

Table 8-E (continued)

Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	Diesel	495	495	495	594	594	594	594	594	594	594	594	0
Asphalt Paver, Cat A-8008	Diesel	0	0	0	0	0	0	264	264	264	264	264	0
Backhoe, Cat, 420E	Diesel	110	110	110	110	110	110	110	0	0	0	0	0
Compactor, Cat CS-563	Diesel	0	0	0	0	0	110	110	110	110	110	110	0
Crane, 150-Ton, Manitowoc	Diesel	88	88	88	88	88	88	88	88	88	0	0	0
Crane, 20-Ton, TR400	Diesel	220	220	220	220	220	220	220	220	220	220	220	220
Crane, 225-Ton, Manitowoc, 4100W	Diesel	88	88	88	88	88	88	0	0	0	0	0	0
Crane, 40-Ton, Grove, TR700B	Diesel	220	220	220	220	220	220	220	220	220	220	220	220
Loader, Cat, 938F	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	132	132	0	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	132	132	132	132	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	792	792	792	660	660	660	660	660	660	660	660	660
Welder, Multiquip, GA 3800	Gasoline	1,287	1,287	1,287	1,287	1,287	1,287	1,144	1,144	1,144	1,144	1,144	1,144
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	Gasoline	330	330	330	330	330	330	330	330	330	330	330	330
On-Site Fuel/Lube Truck	Gasoline	220	220	220	220	220	220	110	110	110	110	110	110
On-Site Flatbed Truck	Gasoline	330	330	330	330	330	330	330	330	330	330	330	330
On-Site Watering Truck	Diesel	176	176	176	176	176	176	176	176	176	176	176	176
On-Site Dump Truck	Diesel	220	220	220	110	110	110	110	110	110	110	110	110
Off-Site Vehicles													
Off-Site Flat Bed Trucks	Gasoline	4,400	4,400	2,200	2,200	440	440	440	440	440	440	440	440
Off-Site Asphalt Trucks	Diesel	0	0	0	0	0	0	880	880	880	880	880	880
Off-Site Cement Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	277,200	242,880	238,920	220,440	219,120	200,640	166,320	155,760	139,920	138,600	137,280	130,680
Off-Site Dump Trucks	Diesel	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760
Off-Site Low Boy Trucks	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	1,320	1,320	1,320
Off-Site Pipe Hauling Trucks	Diesel	10,560	10,560	10,560	2,640	2,640	2,640	0	0	0	0	0	0
Off-Site Water Trucks	Diesel	220	220	220	220	220	220	110	110	110	110	110	110
Off-Site Fuel/Lube Trucks	Gasoline	1,320	880	880	880	880	880	880	880	880	880	880	880
Motor Vehicle Diesel		**12,936**	**12,936**	**12,936**	**4,906**	**4,906**	**4,906**	**3,036**	**3,036**	**3,036**	**3,036**	**3,036**	**3,036**
Motor Vehicle Gasoline		**286,000**	**251,240**	**245,080**	**226,600**	**223,520**	**205,040**	**170,610**	**160,050**	**144,210**	**142,010**	**140,690**	**134,090**

a Based on 22 working days per month

Table 8-F
Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Fuel Use

Equipment/Vehicle Type	Fuel Consumption (gal/hr or	Monthly Fuel Use (gal/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	2.1539	853.0	853.0	853.0	853.0	853.0	853.0	853.0	1,066.2	1,066.2	1,066.2	1,066.2	1,066.2	1,066.2	1,066.2	1,066.2
Asphalt Paver, Cat A-8008	3.1827	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	2.3717	521.8	521.8	521.8	521.8	521.8	521.8	521.8	521.8	521.8	521.8	260.9	260.9	260.9	260.9	260.9
Compactor, Cat CS-563	4.9389	543.3	543.3	543.3	543.3	543.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 150-Ton, Manitowoc	5.0958	0.0	0.0	0.0	0.0	448.4	448.4	896.9	896.9	896.9	896.9	896.9	896.9	448.4	448.4	448.4
Crane, 20-Ton, TR400	5.0958	0.0	0.0	0.0	560.5	560.5	560.5	560.5	560.5	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1
Crane, 225-Ton, Manitowoc, 4100W	8.1878	0.0	0.0	0.0	0.0	0.0	0.0	0.0	720.5	720.5	720.5	720.5	1,441.0	1,441.0	1,441.0	1,441.0
Crane, 40-Ton, Grove, TR700B	5.0958	0.0	0.0	560.5	560.5	560.5	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,681.6	1,681.6	2,242.1	2,242.1
Loader, Cat, 938F	4.8570	534.3	534.3	534.3	534.3	534.3	534.3	534.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	5.6621	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4
Trencher, Cat 140G	2.9838	393.9	393.9	393.9	393.9	393.9	393.9	393.9	393.9	393.9	393.9	393.9	393.9	393.9	393.9	393.9
Truck, Concrete Pump, International	7.5562	664.9	1,329.9	1,329.9	1,329.9	1,329.9	1,329.9	1,329.9	664.9	664.9	664.9	664.9	664.9	664.9	664.9	664.9
Welder, Multiquip, BLW-300SS	0.5170	68.2	68.2	68.2	136.5	204.7	409.4	614.2	614.2	614.2	614.2	614.2	614.2	545.9	477.7	409.4
Welder, Multiquip, GA 3800	0.5968	426.7	426.7	426.7	426.7	597.4	597.4	597.4	597.4	597.4	597.4	682.7	768.0	768.0	768.0	768.0
Motor Vehicles																
On-site Vehicles																
On-Site Welding Truck	0.0716	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	23.6	23.6	23.6	23.6	23.6
On-Site Fuel/Lube Truck	0.0716	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	15.8	15.8	15.8	15.8	15.8	15.8
On-Site Flatbed Truck	0.0720	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8
On-Site Watering Truck	0.1825	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
On-Site Dump Truck	0.1825	20.1	20.1	20.1	20.1	20.1	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0716	126.1	126.1	126.1	126.1	126.1	283.6	283.6	472.7	472.7	630.3	630.3	630.3	472.7	472.7	315.1
Off-Site Asphalt Trucks	0.1825	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.1825	0.0	0.0	401.6	401.6	401.6	401.6	401.6	481.9	481.9	240.9	80.3	80.3	80.3	80.3	80.3
Off-Site Construction Worker Commute	0.0523	8,910.2	10,222.5	11,534.9	12,778.2	14,090.5	17,405.9	18,165.7	18,442.0	18,580.1	18,787.4	18,787.4	19,685.3	18,787.4	17,889.4	15,679.2
Off-Site Dump Trucks	0.1825	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2
Off-Site Low Boy Trucks	0.1825	0.0	0.0	0.0	0.0	301.2	301.2	301.2	301.2	301.2	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0523	115.1	115.1	115.1	115.1	115.1	115.1	161.2	276.3	276.3	230.2	230.2	230.2	230.2	230.2	230.2
Off-Site Pipe Hauling Trucks	0.1825	0.0	0.0	0.0	0.0	0.0	1,927.5	1,927.5	3,855.0	3,855.0	3,855.0	3,855.0	1,927.5	1,927.5	1,927.5	1,927.5
Off-Site Water Trucks	0.1825	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	40.2	40.2	40.2	40.2	40.2	40.2	40.2
Off-Site Fuel/Lube Trucks	0.0716	63.0	63.0	63.0	63.0	63.0	94.5	94.5	94.5	94.5	94.5	94.5	94.5	94.5	94.5	94.5
Construction Equipment Diesel		**4,326.7**	**4,991.7**	**5,552.2**	**6,181.0**	**6,697.6**	**6,919.6**	**7,572.8**	**7,307.3**	**7,867.9**	**7,867.9**	**7,607.0**	**8,888.0**	**8,371.4**	**8,863.7**	**8,795.4**
Construction Equipment Gasoline		**426.7**	**426.7**	**426.7**	**426.7**	**597.4**	**597.4**	**597.4**	**597.4**	**597.4**	**597.4**	**682.7**	**768.0**	**768.0**	**768.0**	**768.0**
Motor Vehicle Diesel		**393.5**	**393.5**	**795.1**	**795.1**	**1,096.3**	**3,043.8**	**3,043.8**	**5,051.6**	**5,071.7**	**4,529.6**	**4,369.0**	**2,441.5**	**2,441.5**	**2,441.5**	**2,441.5**
Motor Vehicle Gasoline		**9,253.9**	**10,566.2**	**11,878.6**	**13,121.8**	**14,434.2**	**17,938.7**	**18,744.5**	**19,325.0**	**19,471.1**	**19,797.7**	**19,805.5**	**20,703.5**	**19,648.0**	**18,750.1**	**16,382.2**

Table 8-F (continued)

Combined Cycle Facility Construction Monthly Construction Equipment and Motor Vehicle Fuel Use

Equipment/Vehicle Type	Fuel Consumption (gal/hr or	Monthly Fuel Use (gal/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	2.1539	1,066.2	1,066.2	1,066.2	1,279.4	1,279.4	1,279.4	1,279.4	1,279.4	1,279.4	1,279.4	1,279.4	0.0
Asphalt Paver, Cat A-8008	3.1827	0.0	0.0	0.0	0.0	0.0	0.0	840.2	840.2	840.2	840.2	840.2	0.0
Backhoe, Cat, 420E	2.3717	260.9	260.9	260.9	260.9	260.9	260.9	260.9	0.0	0.0	0.0	0.0	0.0
Compactor, Cat CS-563	4.9389	0.0	0.0	0.0	0.0	0.0	543.3	543.3	543.3	543.3	543.3	543.3	0.0
Crane, 150-Ton, Manitowoc	5.0958	448.4	448.4	448.4	448.4	448.4	448.4	448.4	448.4	448.4	0.0	0.0	0.0
Crane, 20-Ton, TR400	5.0958	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1
Crane, 225-Ton, Manitowoc, 4100W	8.1878	720.5	720.5	720.5	720.5	720.5	720.5	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 40-Ton, Grove, TR700B	5.0958	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1	1,121.1
Loader, Cat, 938F	4.8570	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	5.6621	747.4	747.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	2.9838	393.9	393.9	393.9	393.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	7.5562	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.5170	409.4	409.4	409.4	341.2	341.2	341.2	341.2	341.2	341.2	341.2	341.2	341.2
Welder, Multiquip, GA 3800	0.5968	768.0	768.0	768.0	768.0	768.0	768.0	682.7	682.7	682.7	682.7	682.7	682.7
Motor Vehicles													
On-site Vehicles													
On-Site Welding Truck	0.0716	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6
On-Site Fuel/Lube Truck	0.0716	15.8	15.8	15.8	15.8	15.8	15.8	7.9	7.9	7.9	7.9	7.9	7.9
On-Site Flatbed Truck	0.0720	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8
On-Site Watering Truck	0.1825	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1	32.1
On-Site Dump Truck	0.1825	40.2	40.2	40.2	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0716	315.1	315.1	157.6	157.6	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
Off-Site Asphalt Trucks	0.1825	0.0	0.0	0.0	0.0	0.0	0.0	160.6	160.6	160.6	160.6	160.6	160.6
Off-Site Cement Trucks	0.1825	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0523	14,504.9	12,709.1	12,501.9	11,534.9	11,465.8	10,498.8	8,703.0	8,150.4	7,321.5	7,252.5	7,183.4	6,838.0
Off-Site Dump Trucks	0.1825	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2
Off-Site Low Boy Trucks	0.1825	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0523	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	69.1	69.1	69.1
Off-Site Pipe Hauling Trucks	0.1825	1,927.5	1,927.5	1,927.5	481.9	481.9	481.9	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.1825	40.2	40.2	40.2	40.2	40.2	40.2	20.1	20.1	20.1	20.1	20.1	20.1
Off-Site Fuel/Lube Trucks	0.0716	94.5	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0
Construction Equipment Diesel		**6,288.9**	**6,288.9**	**5,541.5**	**5,686.5**	**5,292.6**	**5,835.9**	**5,955.6**	**5,694.7**	**5,694.7**	**5,246.3**	**5,246.3**	**2,583.3**
Construction Equipment Gasoline		**768.0**	**768.0**	**768.0**	**768.0**	**768.0**	**768.0**	**682.7**	**682.7**	**682.7**	**682.7**	**682.7**	**682.7**
Motor Vehicle Diesel		**2,361.2**	**2,361.2**	**2,361.2**	**895.5**	**895.5**	**895.5**	**554.2**	**554.2**	**554.2**	**554.2**	**554.2**	**554.2**
Motor Vehicle Gasoline		**15,092.9**	**13,265.5**	**12,900.7**	**11,933.7**	**11,738.6**	**10,771.6**	**8,967.9**	**8,415.3**	**7,586.5**	**7,471.4**	**7,402.3**	**7,056.9**

Note: Totals may not match sum of individual values because of rounding.

Table 9-A
Solar Array Construction Construction Equipment Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)[a]	CH_4 Emission Factor (kg/gallon)	CH_4 Emissions (MT)[a]	N_2O Emission Factor (kg/gallon)	N_2O Emissions (MT)[a]
Construction Equipment Diesel	254,246	1.01E+01	2,578	4.16E-04	0.11	8.32E-05	0.02
Construction Equipment Gasoline	12,545	8.80E+00	110	3.73E-04	0.00	7.45E-05	0.00
Total			**2,688**		**0**		**0**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Table 9-B
Solar Array Construction Motor Vehicle Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	Total VMT (miles)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)	CH_4 Emission Factor (g/mi)	CH_4 Emissions (MT)	N_2O Emission Factor (g/mi)	N_2O Emissions (MT)
Motor Vehicle Diesel	180,750	990,264	9.96E+00	1,800	5.10E-03	0.01	4.80E-03	0.00
Motor Vehicle Gasoline	183,923	3,381,268	8.55E+00	1,573	1.50E-02	0.05	1.00E-02	0.03
Total				**3,373**		**0.06**		**0.04**

Table 9-C
Solar Array Construction Greenhouse Gas Emissions Summary

Item	CO_2	CH_4	N_2O
Emissions (MT)	6,061	0.17	0.06
Global Warming Potential[a]	1	21	310
Emissions (MT CO_2e)	6,061	3	19
Total Emissions (MT CO_2e)	**6,084**		

[a] From Table 2, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

Table 9-D

Solar Array Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number													
			Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	4.5	0	0	0	0	0	1	1	3	6	6	6	6	6	6
Crane, 20-Ton, TR400	Diesel	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	6.5	0	0	0	0	0	0	6	9	9	12	12	12	12	12
Welder, Multiquip, BLW-300SS	Diesel	6	0	0	0	0	0	0	2	2	4	4	6	6	6	6
Backhoe, Cat, 420E	Diesel	6	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Trencher, Cat 140G	Diesel	6	0	0	0	0	0	0	1	1	1	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	6	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Scraper, CAT 657G, Tractor Engine	Diesel	8	0	4	4	4	4	4	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	8	0	4	4	4	4	4	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	6	0	0	0	0	0	0	0	0	2	2	2	2	2	2
Truck, Concrete Pump, International	Diesel	6	0	0	0	0	0	0	3	5	6	6	6	6	6	6
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	Diesel	9	0	8	8	8	8	8	3	3	3	3	3	3	2	2
On-Site Flatbed Truck	Gasoline	5	0	0	0	0	0	0	1	1	2	2	2	2	2	2
On-Site Pickup Truck	Gasoline	4	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	160	0	0	0	0	0	6	6	6	6	6	6	6	6	6
Off-Site Cement Trucks	Diesel	20	0	0	0	0	0	0	3	5	6	6	6	6	6	6
Off-Site Dump Trucks	Diesel	40	0	0	0	0	0	2	2	2	2	2	2	2	2	2
Off-Site Pickup Trucks	Gasoline	20	0	0	2	2	2	2	2	2	2	2	2	2	2	2
Off-Site Pipe Hauling Trucks	Diesel	14	0	0	0	0	0	2	2	2	2	2	2	2	2	2
Off-Site Water Trucks	Diesel	5	0	0	10	10	10	0	3	3	3	3	3	3	3	3
Off-Site Construction Worker Commute	Gasoline	60	5	5	40	40	40	60	80	100	140	180	220	340	360	300
Off-Site Tractor-Trailer	Diesel	200	0	0	0	0	0	12	12	12	12	12	12	12	12	12

Table 9-D (continued)
Solar Array Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number												
			Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment															
Air Compressor, Ingersoll-Rand	Diesel	4.5	6	3	3	3	3	3	3	3	0	0	0	0	0
Crane, 20-Ton, TR400	Diesel	6	0	0	1	1	1	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	6.5	12	9	9	9	6	6	6	6	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	6	6	6	6	6	6	6	4	2	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	6	1	1	1	1	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	6	0	0	1	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	6	1	1	1	1	1	1	1	1	0	0	0	0	0
Scraper, CAT 657G, Tractor Engine	Diesel	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	6	2	2	2	2	0	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	6	6	6	6	6	0	0	0	0	0	0	0	0	0
Motor Vehicles															
On-site Vehicles															
On-Site Watering Truck	Diesel	9	2	2	2	2	1	1	1	1	0	0	0	0	0
On-Site Flatbed Truck	Gasoline	5	2	2	2	2	2	2	2	2	0	0	0	0	0
On-Site Pickup Truck	Gasoline	4	2	2	2	2	2	2	2	2	0	0	0	0	0
Off-Site Vehicles															
Off-Site Flat Bed Trucks	Gasoline	160	6	6	6	6	6	6	6	6	0	0	0	0	0
Off-Site Cement Trucks	Diesel	20	6	6	6	6	0	0	0	0	0	0	0	0	0
Off-Site Dump Trucks	Diesel	40	2	2	2	2	2	2	2	2	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	20	2	2	2	2	2	2	2	2	2	2	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	14	2	2	2	2	2	2	2	2	0	0	0	0	0
Off-Site Water Trucks	Diesel	5	3	3	3	3	1	1	1	1	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	60	180	80	50	50	0	0	0	0	0	0	0	0	0
Off-Site Tractor-Trailer	Diesel	200	12	12	12	12	12	12	12	12	0	0	0	0	0

Table 9-E
Solar Array Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	Diesel	0	0	0	0	0	99	99	297	594	594	594	594	594	594	594
Crane, 20-Ton, TR400	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	0	0	0	0	0	0	858	1,287	1,287	1,716	1,716	1,716	1,716	1,716	1,716
Welder, Multiquip, BLW-300SS	Diesel	0	0	0	0	0	0	264	264	528	528	792	792	792	792	792
Backhoe, Cat, 420E	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	132	132	132
Trencher, Cat 140G	Diesel	0	0	0	0	0	0	132	132	132	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	0	0	0	0	0	0	132	132	132	132	132	132	132	132	132
Scraper, CAT 657G, Tractor Engine	Diesel	0	704	704	704	704	704	0	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	0	704	704	704	704	704	0	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	0	0	0	0	0	0	0	0	264	264	264	264	264	264	264
Truck, Concrete Pump, International	Diesel	0	0	0	0	0	0	396	660	792	792	792	792	792	792	792
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	Diesel	0	1,584	1,584	1,584	1,584	1,584	594	594	594	594	594	594	396	396	396
On-Site Flatbed Truck	Gasoline	0	0	0	0	0	0	110	110	220	220	220	220	220	220	220
On-Site Pickup Truck	Gasoline	88	88	88	88	88	88	88	88	176	176	176	176	176	176	176
Off-Site Vehicles																
Off-Site Flat Bed Trucks	Gasoline	0	0	0	0	0	21,120	21,120	21,120	21,120	21,120	21,120	21,120	21,120	21,120	21,120
Off-Site Cement Trucks	Diesel	0	0	0	0	0	0	1,320	2,200	2,640	2,640	2,640	2,640	2,640	2,640	2,640
Off-Site Dump Trucks	Diesel	0	0	0	0	0	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760	1,760
Off-Site Pickup Trucks	Gasoline	0	0	880	880	880	880	880	880	880	880	880	880	880	880	880
Off-Site Pipe Hauling Trucks	Diesel	0	0	0	0	0	616	616	616	616	616	616	616	616	616	616
Off-Site Water Trucks	Diesel	0	0	1,100	1,100	1,100	0	330	330	330	330	330	330	330	330	330
Off-Site Construction Worker Commute	Gasoline	6,600	6,600	52,800	52,800	52,800	79,200	105,600	132,000	184,800	237,600	290,400	448,800	475,200	396,000	237,600
Off-Site Tractor-Trailer	Diesel	0	0	0	0	0	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800	52,800
Motor Vehicle Diesel		**0**	**1,584**	**2,684**	**2,684**	**2,684**	**56,760**	**57,420**	**58,300**	**58,740**	**58,740**	**58,740**	**58,740**	**58,542**	**58,542**	**58,542**
Motor Vehicle Gasoline		**6,688**	**6,688**	**53,768**	**53,768**	**53,768**	**101,288**	**127,798**	**154,198**	**207,196**	**259,996**	**312,796**	**471,196**	**497,596**	**418,396**	**259,996**

Table 9-E (continued)
Solar Array Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	Diesel	297	297	297	297	297	297	297	0	0	0	0	0
Crane, 20-Ton, TR400	Diesel	0	132	132	132	0	0	0	0	0	0	0	0
Welder, Multiquip, GA 3800	Gasoline	1,287	1,287	1,287	858	858	858	858	0	0	0	0	0
Welder, Multiquip, BLW-300SS	Diesel	792	792	792	792	792	528	264	0	0	0	0	0
Backhoe, Cat, 420E	Diesel	132	132	132	0	0	0	0	0	0	0	0	0
Trencher, Cat 140G	Diesel	0	132	0	0	0	0	0	0	0	0	0	0
Motor Grader, Cat 135H	Diesel	132	132	132	132	132	132	132	0	0	0	0	0
Scraper, CAT 657G, Tractor Engine	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Scraper, CAT 657G, Scraper Engine	Diesel	0	0	0	0	0	0	0	0	0	0	0	0
Pipelayer, Cat 561N	Diesel	264	264	264	0	0	0	0	0	0	0	0	0
Truck, Concrete Pump, International	Diesel	792	792	792	0	0	0	0	0	0	0	0	0
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	Diesel	396	396	396	198	198	198	198	0	0	0	0	0
On-Site Flatbed Truck	Gasoline	220	220	220	220	220	220	220	0	0	0	0	0
On-Site Pickup Truck	Gasoline	176	176	176	176	176	176	176	0	0	0	0	0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	Gasoline	21,120	21,120	21,120	21,120	21,120	21,120	21,120	0	0	0	0	0
Off-Site Cement Trucks	Diesel	2,640	2,640	2,640	0	0	0	0	0	0	0	0	0
Off-Site Dump Trucks	Diesel	1,760	1,760	1,760	1,760	1,760	1,760	1,760	0	0	0	0	0
Off-Site Pickup Trucks	Gasoline	880	880	880	880	880	880	880	880	880	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	616	616	616	616	616	616	616	0	0	0	0	0
Off-Site Water Trucks	Diesel	330	330	330	110	110	110	110	0	0	0	0	0
Off-Site Construction Worker Commute	Gasoline	105,600	66,000	66,000	0	0	0	0	0	0	0	0	0
Off-Site Tractor-Trailer	Diesel	52,800	52,800	52,800	52,800	52,800	52,800	52,800	0	0	0	0	0
Motor Vehicle Diesel		**58,542**	**58,542**	**58,542**	**55,484**	**55,484**	**55,484**	**55,484**	**0**	**0**	**0**	**0**	**0**
Motor Vehicle Gasoline		**127,996**	**88,396**	**88,396**	**22,396**	**22,396**	**22,396**	**22,396**	**880**	**880**	**0**	**0**	**0**

a Based on 22 working days per month

Table 9-F

Solar Array Construction Monthly Construction Equipment and Motor Vehicle Fuel Use

Equipment/Vehicle Type	Fuel Consumption (gal/hr or gal/mile)	Monthly Fuel Use (gal/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Air Compressor, Ingersoll-Rand	2.1539	0.0	0.0	0.0	0.0	0.0	213.2	213.2	639.7	1,279.4	1,279.4	1,279.4	1,279.4	1,279.4	1,279.4	1,279.4
Crane, 20-Ton, TR400	5.0958	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.5968	0.0	0.0	0.0	0.0	0.0	0.0	512.0	768.0	768.0	1,024.0	1,024.0	1,024.0	1,024.0	1,024.0	1,024.0
Welder, Multiquip, BLW-300SS	0.5170	0.0	0.0	0.0	0.0	0.0	0.0	136.5	136.5	273.0	273.0	409.4	409.4	409.4	409.4	409.4
Backhoe, Cat, 420E	2.3717	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	313.1	313.1	313.1
Trencher, Cat 140G	2.9838	0.0	0.0	0.0	0.0	0.0	0.0	393.9	393.9	393.9	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	5.6621	0.0	0.0	0.0	0.0	0.0	0.0	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4	747.4
Scraper, CAT 657G, Tractor Engine	25.1061	0.0	17,674.7	17,674.7	17,674.7	17,674.7	17,674.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	14.5165	0.0	10,219.6	10,219.6	10,219.6	10,219.6	10,219.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	3.6730	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	969.7	969.7	969.7	969.7	969.7	969.7	969.7
Truck, Concrete Pump, International	7.5562	0.0	0.0	0.0	0.0	0.0	0.0	2,992.3	4,987.1	5,984.5	5,984.5	5,984.5	5,984.5	5,984.5	5,984.5	5,984.5
Motor Vehicles																
On-site Vehicles																
On-Site Watering Truck	0.1825	0.0	289.1	289.1	289.1	289.1	289.1	108.4	108.4	108.4	108.4	108.4	108.4	72.3	72.3	72.3
On-Site Flatbed Truck	0.0720	0.0	0.0	0.0	0.0	0.0	0.0	7.9	7.9	15.8	15.8	15.8	15.8	15.8	15.8	15.8
On-Site Pickup Truck	0.0523	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	9.2	9.2	9.2	9.2	9.2	9.2	9.2
Off-Site Vehicles																
Off-Site Flat Bed Trucks	0.0716	0.0	0.0	0.0	0.0	0.0	1,512.6	1,512.6	1,512.6	1,512.6	1,512.6	1,512.6	1,512.6	1,512.6	1,512.6	1,512.6
Off-Site Cement Trucks	0.1825	0.0	0.0	0.0	0.0	0.0	0.0	240.9	401.6	481.9	481.9	481.9	481.9	481.9	481.9	481.9
Off-Site Dump Trucks	0.1825	0.0	0.0	0.0	0.0	0.0	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2	321.2
Off-Site Pickup Trucks	0.0523	0.0	0.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0
Off-Site Pipe Hauling Trucks	0.1825	0.0	0.0	0.0	0.0	0.0	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
Off-Site Water Trucks	0.1825	0.0	0.0	200.8	200.8	200.8	0.0	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2
Off-Site Construction Worker Commute	0.0523	345.4	345.4	2,762.8	2,762.8	2,762.8	4,144.3	5,525.7	6,907.1	9,670.0	12,432.8	15,195.7	23,484.2	24,865.6	20,721.4	12,432.8
Off-Site Tractor-Trailer	0.1825	0.0	0.0	0.0	0.0	0.0	9,637.5	9,637.5	9,637.5	9,637.5	9,637.5	9,637.5	9,637.5	9,637.5	9,637.5	9,637.5
Construction Equipment Diesel		**0.0**	**27,894.3**	**27,894.3**	**27,894.3**	**27,894.3**	**28,107.6**	**4,483.2**	**6,904.6**	**9,647.9**	**9,254.0**	**9,390.5**	**9,390.5**	**9,703.5**	**9,703.5**	**9,703.5**
Construction Equipment Gasoline		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**512.0**	**768.0**	**768.0**	**1,024.0**	**1,024.0**	**1,024.0**	**1,024.0**	**1,024.0**	**1,024.0**
Motor Vehicle Diesel		**0.0**	**289.1**	**489.9**	**489.9**	**489.9**	**10,360.3**	**10,480.7**	**10,641.4**	**10,721.7**	**10,721.7**	**10,721.7**	**10,721.7**	**10,685.5**	**10,685.5**	**10,685.5**
Motor Vehicle Gasoline		**350.0**	**350.0**	**2,813.5**	**2,813.5**	**2,813.5**	**5,707.5**	**7,096.9**	**8,478.3**	**11,253.7**	**14,016.5**	**16,779.4**	**25,067.9**	**26,449.3**	**22,305.1**	**14,016.5**

Table 9-F (continued)
Solar Array Construction Monthly Construction Equipment and Motor Vehicle Fuel Use

Equipment/Vehicle Type	Fuel Consumption (gal/hr or gal/mile)	Monthly Fuel Use (gal/month)											
		Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
Construction Equipment													
Air Compressor, Ingersoll-Rand	2.1539	639.7	639.7	639.7	639.7	639.7	639.7	639.7	0.0	0.0	0.0	0.0	0.0
Crane, 20-Ton, TR400	5.0958	0.0	672.6	672.6	672.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, GA 3800	0.5968	768.0	768.0	768.0	512.0	512.0	512.0	512.0	0.0	0.0	0.0	0.0	0.0
Welder, Multiquip, BLW-300SS	0.5170	409.4	409.4	409.4	409.4	409.4	273.0	136.5	0.0	0.0	0.0	0.0	0.0
Backhoe, Cat, 420E	2.3717	313.1	313.1	313.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trencher, Cat 140G	2.9838	0.0	393.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader, Cat 135H	5.6621	747.4	747.4	747.4	747.4	747.4	747.4	747.4	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Tractor Engine	25.1061	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scraper, CAT 657G, Scraper Engine	14.5165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pipelayer, Cat 561N	3.6730	969.7	969.7	969.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Truck, Concrete Pump, International	7.5562	5,984.5	5,984.5	5,984.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor Vehicles													
On-site Vehicles													
On-Site Watering Truck	0.1825	72.3	72.3	72.3	36.1	36.1	36.1	36.1	0.0	0.0	0.0	0.0	0.0
On-Site Flatbed Truck	0.0720	15.8	15.8	15.8	15.8	15.8	15.8	15.8	0.0	0.0	0.0	0.0	0.0
On-Site Pickup Truck	0.0523	9.2	9.2	9.2	9.2	9.2	9.2	9.2	0.0	0.0	0.0	0.0	0.0
Off-Site Vehicles													
Off-Site Flat Bed Trucks	0.0716	1,512.6	1,512.6	1,512.6	1,512.6	1,512.6	1,512.6	1,512.6	0.0	0.0	0.0	0.0	0.0
Off-Site Cement Trucks	0.1825	481.9	481.9	481.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Dump Trucks	0.1825	321.2	321.2	321.2	321.2	321.2	321.2	321.2	0.0	0.0	0.0	0.0	0.0
Off-Site Pickup Trucks	0.0523	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.1825	112.4	112.4	112.4	112.4	112.4	112.4	112.4	0.0	0.0	0.0	0.0	0.0
Off-Site Water Trucks	0.1825	60.2	60.2	60.2	20.1	20.1	20.1	20.1	0.0	0.0	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0523	5,525.7	3,453.6	3,453.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Tractor-Trailer	0.1825	9,637.5	9,637.5	9,637.5	9,637.5	9,637.5	9,637.5	9,637.5	0.0	0.0	0.0	0.0	0.0
Construction Equipment Diesel		**9,063.8**	**10,130.3**	**9,736.5**	**2,469.2**	**1,796.6**	**1,660.1**	**1,523.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Construction Equipment Gasoline		**768.0**	**768.0**	**768.0**	**512.0**	**512.0**	**512.0**	**512.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicle Diesel		**10,685.5**	**10,685.5**	**10,685.5**	**10,127.4**	**10,127.4**	**10,127.4**	**10,127.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicle Gasoline		**7,109.4**	**5,037.3**	**5,037.3**	**1,583.7**	**1,583.7**	**1,583.7**	**1,583.7**	**46.0**	**46.0**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 10-A

Reclaimed Water Line Construction Construction Equipment Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)[a]	CH_4 Emission Factor (kg/gallon)	CH_4 Emissions (MT)[a]	N_2O Emission Factor (kg/gallon)	N_2O Emissions (MT)[a]
Construction Equipment Diesel	40,426	1.01E+01	410	4.16E-04	0.02	8.32E-05	0.00
Construction Equipment Gasoline	0	8.80E+00	0	3.73E-04	0.00	7.45E-05	0.00
Total			**410**		**0**		**0**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Table 10-B

Reclaimed Water Line Construction Motor Vehicle Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	Total VMT (miles)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)	CH_4 Emission Factor (g/mi)	CH_4 Emissions (MT)	N_2O Emission Factor (g/mi)	N_2O Emissions (MT)
Motor Vehicle Diesel	115,900	24,156	9.96E+00	1,154	5.10E-03	0.00	4.80E-03	0.00
Motor Vehicle Gasoline	40,426	2,185,920	8.55E+00	346	1.50E-02	0.03	1.00E-02	0.02
Total				**1,500**		**0.03**		**0.02**

Table 10-C

Reclaimed Water Line Construction Greenhouse Gas Emissions Summary

Item	CO_2	CH_4	N_2O
Emissions (MT)	1,910	0.05	0.03
Global Warming Potential[a]	1	21	310
Emissions (MT CO_2e)	1,910	1	8
Total Emissions (MT CO_2e)	**1,919**		

[a] From Table 2, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

Table 10-D
Reclaimed Water Line Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number								
			Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment											
Compressor, 250 cfm	Diesel	8	3	3	3	3	6	6	6	6	6
Tractor/Loader/Backhoe	Diesel	3	3	6	0	0	6	6	0	0	0
Backhoe	Diesel	3	0	3	3	0	0	6	6	0	0
Crane, 5 ton	Diesel	3	3	3	3	3	6	6	6	6	6
Welder	Diesel	6	3	3	3	3	6	6	6	6	6
Vibratory Compactor	Diesel	2	0	3	3	3	0	0	6	6	6
Roller, 5 ton	Diesel	2	0	3	3	3	0	0	6	6	6
Motor Vehicles											
Off-Site Vehicles											
Off-Site Dump Trucks	Diesel	40	0	3	3	3	0	0	3	3	3
Off-Site Pipe Hauling Trucks	Diesel	14	3	3	3	3	3	3	3	3	3
Off-Site Construction Worker Commute	Gasoline	60	144	144	144	144	216	216	216	216	216

Table 10-E
Reclaimed Water Line Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment										
Compressor, 250 cfm	Diesel	528	528	528	528	1,056	1,056	1,056	1,056	1,056
Tractor/Loader/Backhoe	Diesel	198	396	0	0	396	396	0	0	0
Backhoe	Diesel	0	198	198	0	0	396	396	0	0
Crane, 5 ton	Diesel	198	198	198	198	396	396	396	396	396
Welder	Diesel	396	396	396	396	792	792	792	792	792
Vibratory Compactor	Diesel	0	132	132	132	0	0	264	264	264
Roller, 5 ton	Diesel	0	132	132	132	0	0	264	264	264
Motor Vehicles										
Off-Site Vehicles										
Off-Site Dump Trucks	Diesel	0	2,640	2,640	2,640	0	0	2,640	2,640	2,640
Off-Site Pipe Hauling Trucks	Diesel	924	924	924	924	924	924	924	924	924
Off-Site Construction Worker Commute	Gasoline	190,080	190,080	190,080	190,080	285,120	285,120	285,120	285,120	285,120
Motor Vehicle Diesel		**924**	**3,564**	**3,564**	**3,564**	**924**	**924**	**3,564**	**3,564**	**3,564**
Motor Vehicle Gasoline		**190,080**	**190,080**	**190,080**	**190,080**	**285,120**	**285,120**	**285,120**	**285,120**	**285,120**

a Based on 22 working days per month

Table 10-F
Reclaimed Water Line Construction Monthly Construction Equipment and Motor Vehicle Fuel Use

Equipment/Vehicle Type	Fuel Consumption (gal/hr or gal/mile)	Monthly Fuel Use (gal/month)								
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Construction Equipment										
Compressor, 250 cfm	2.1539	1,137.3	1,137.3	1,137.3	1,137.3	2,274.5	2,274.5	2,274.5	2,274.5	2,274.5
Tractor/Loader/Backhoe	2.3717	469.6	939.2	0.0	0.0	939.2	939.2	0.0	0.0	0.0
Backhoe	1.4177	0.0	280.7	280.7	0.0	0.0	561.4	561.4	0.0	0.0
Crane, 5 ton	2.3049	456.4	456.4	456.4	456.4	912.7	912.7	912.7	912.7	912.7
Welder	1.2103	479.3	479.3	479.3	479.3	958.6	958.6	958.6	958.6	958.6
Vibratory Compactor	2.7075	0.0	357.4	357.4	357.4	0.0	0.0	714.8	714.8	714.8
Roller, 5 ton	2.7075	0.0	357.4	357.4	357.4	0.0	0.0	714.8	714.8	714.8
Motor Vehicles										
Off-Site Vehicles										
Off-Site Dump Trucks	0.1825	0.0	481.9	481.9	481.9	0.0	0.0	481.9	481.9	481.9
Off-Site Pipe Hauling Trucks	0.1825	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7
Off-Site Construction Worker Commute	0.0523	9,946.3	9,946.3	9,946.3	9,946.3	14,919.4	14,919.4	14,919.4	14,919.4	14,919.4
Construction Equipment Diesel		**2,542.5**	**4,007.6**	**3,068.4**	**2,787.7**	**5,085.1**	**5,646.5**	**6,136.9**	**5,575.5**	**5,575.5**
Construction Equipment Gasoline		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicle Diesel		**10,114.9**	**10,114.9**	**10,114.9**	**10,114.9**	**15,088.0**	**15,088.0**	**15,088.0**	**15,088.0**	**15,088.0**
Motor Vehicle Gasoline		**2,542.5**	**4,007.6**	**3,068.4**	**2,787.7**	**5,085.1**	**5,646.5**	**6,136.9**	**5,575.5**	**5,575.5**

Note: Totals may not match sum of individual values because of rounding.

Table 11-A

Natural Gas Pipeline Construction Construction Equipment Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)[a]	CH_4 Emission Factor (kg/gallon)	CH_4 Emissions (MT)[a]	N_2O Emission Factor (kg/gallon)	N_2O Emissions (MT)[a]
Construction Equipment Diesel	73,878	1.01E+01	749	4.16E-04	0.03	8.32E-05	0.01
Construction Equipment Gasoline	0	8.80E+00	0	3.73E-04	0.00	7.45E-05	0.00
Total			**749**		**0**		**0**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Table 11-B

Natural Gas Pipeline Construction Motor Vehicle Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	Total VMT (miles)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)	CH_4 Emission Factor (g/mi)	CH_4 Emissions (MT)	N_2O Emission Factor (g/mi)	N_2O Emissions (MT)
Motor Vehicle Diesel	8,312	45,540	9.96E+00	83	5.10E-03	0.00	4.80E-03	0.00
Motor Vehicle Gasoline	203,898	3,896,640	8.55E+00	1,743	1.50E-02	0.06	1.00E-02	0.04
Total				**1,826**		**0.06**		**0.04**

Table 11-C

Natural Gas Pipeline Construction Greenhouse Gas Emissions Summary

Item	CO_2	CH_4	N_2O
Emissions (MT)	2,575	0.09	0.05
Global Warming Potential[a]	1	21	310
Emissions (MT CO_2e)	2,575	2	14
Total Emissions (MT CO_2e)	**2,591**		

[a] From Table 2, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

Table 11-D

Natural Gas Pipeline Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number: Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																	
Compressor, 250 cfm	Diesel	8	3	3	3	3	6	6	6	6	6	6	6	6	6	6	6
Tractor/Loader/Backhoe	Diesel	3	3	6	0	0	6	6	0	0	0	0	0	0	0	0	0
Backhoe	Diesel	3	0	3	3	0	0	6	6	0	0	0	0	0	0	0	0
Crane, 5 ton	Diesel	3	3	3	3	3	6	6	6	6	6	6	6	6	6	6	6
Welder	Diesel	6	3	3	3	3	6	6	6	6	6	6	6	6	6	6	6
Vibratory Compactor	Diesel	2	0	3	3	3	0	0	6	6	6	6	6	6	6	6	6
Roller, 5 ton	Diesel	2	0	3	3	3	0	0	6	6	6	6	6	6	6	6	6
Motor Vehicles																	
Off-Site Vehicles																	
Off-Site Dump Trucks	Diesel	40	0	3	3	3	0	0	3	3	3	3	3	3	3	3	3
Off-Site Pipe Hauling Trucks	Diesel	14	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Off-Site Construction Worker Commute	Gasoline	60	144	144	144	144	216	216	216	216	216	216	216	216	216	216	216

Table 11-E

Natural Gas Pipeline Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Compressor, 250 cfm	Diesel	528	528	528	528	1,056	1,056	1,056	1,056	1,056	1,056	1,056	1,056	1,056	1,056	1,056
Tractor/Loader/Backhoe	Diesel	198	396	0	0	396	396	0	0	0	0	0	0	0	0	0
Backhoe	Diesel	0	198	198	0	0	396	396	0	0	0	0	0	0	0	0
Crane, 5 ton	Diesel	198	198	198	198	396	396	396	396	396	396	396	396	396	396	396
Welder	Diesel	396	396	396	396	792	792	792	792	792	792	792	792	792	792	792
Vibratory Compactor	Diesel	0	132	132	132	0	0	264	264	264	264	264	264	264	264	264
Roller, 5 ton	Diesel	0	132	132	132	0	0	264	264	264	264	264	264	264	264	264
Motor Vehicles																
Off-Site Vehicles																
Off-Site Dump Trucks	Diesel	0	2,640	2,640	2,640	0	0	2,640	2,640	2,640	2,640	2,640	2,640	2,640	2,640	2,640
Off-Site Pipe Hauling Trucks	Diesel	924	924	924	924	924	924	924	924	924	924	924	924	924	924	924
Off-Site Construction Worker Commute	Gasoline	190,080	190,080	190,080	190,080	285,120	285,120	285,120	285,120	285,120	285,120	285,120	285,120	285,120	285,120	285,120
Motor Vehicle Diesel		**924**	**3,564**	**3,564**	**3,564**	**924**	**924**	**3,564**	**3,564**	**3,564**	**3,564**	**3,564**	**3,564**	**3,564**	**3,564**	**3,564**
Motor Vehicle Gasoline		**190,080**	**190,080**	**190,080**	**190,080**	**285,120**	**285,120**	**285,120**	**285,120**	**285,120**	**285,120**	**285,120**	**285,120**	**285,120**	**285,120**	**285,120**

a Based on 22 working days per month

Table 11-F

Natural Gas Pipeline Construction Monthly Construction Equipment and Motor Vehicle Fuel Use

Equipment/Vehicle Type	Fuel Consumption (gal/hr or gal/mile)	Monthly Fuel Use (gal/month)														
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15
Construction Equipment																
Compressor, 250 cfm	2.1539	1,137.3	1,137.3	1,137.3	1,137.3	2,274.5	2,274.5	2,274.5	2,274.5	2,274.5	2,274.5	2,274.5	2,274.5	2,274.5	2,274.5	2,274.5
Tractor/Loader/Backhoe	2.3717	469.6	939.2	0.0	0.0	939.2	939.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backhoe	1.4177	0.0	280.7	280.7	0.0	0.0	561.4	561.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	2.3049	456.4	456.4	456.4	456.4	912.7	912.7	912.7	912.7	912.7	912.7	912.7	912.7	912.7	912.7	912.7
Welder	1.2103	479.3	479.3	479.3	479.3	958.6	958.6	958.6	958.6	958.6	958.6	958.6	958.6	958.6	958.6	958.6
Vibratory Compactor	2.7075	0.0	357.4	357.4	357.4	0.0	0.0	714.8	714.8	714.8	714.8	714.8	714.8	714.8	714.8	714.8
Roller, 5 ton	2.7075	0.0	357.4	357.4	357.4	0.0	0.0	714.8	714.8	714.8	714.8	714.8	714.8	714.8	714.8	714.8
Motor Vehicles																
Off-Site Vehicles																
Off-Site Dump Trucks	0.1825	0.0	481.9	481.9	481.9	0.0	0.0	481.9	481.9	481.9	481.9	481.9	481.9	481.9	481.9	481.9
Off-Site Pipe Hauling Trucks	0.1825	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7	168.7
Off-Site Construction Worker Commute	0.0523	9,946.3	9,946.3	9,946.3	9,946.3	14,919.4	14,919.4	14,919.4	14,919.4	14,919.4	14,919.4	14,919.4	14,919.4	14,919.4	14,919.4	14,919.4
Construction Equipment Diesel		**2,542.5**	**4,007.6**	**3,068.4**	**2,787.7**	**5,085.1**	**5,646.5**	**6,136.9**	**5,575.5**	**5,575.5**	**5,575.5**	**5,575.5**	**5,575.5**	**5,575.5**	**5,575.5**	**5,575.5**
Construction Equipment Gasoline		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicle Diesel		**168.7**	**650.5**	**650.5**	**650.5**	**168.7**	**168.7**	**650.5**	**650.5**	**650.5**	**650.5**	**650.5**	**650.5**	**650.5**	**650.5**	**650.5**
Motor Vehicle Gasoline		**9,946.3**	**9,946.3**	**9,946.3**	**9,946.3**	**14,919.4**	**14,919.4**	**14,919.4**	**14,919.4**	**14,919.4**	**14,919.4**	**14,919.4**	**14,919.4**	**14,919.4**	**14,919.4**	**14,919.4**

Note: Totals may not match sum of individual values because of rounding.

Table 12-A
Sewer Line Construction Construction Equipment Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	CO_2		CH_4		N_2O	
		Emission Factor (kg/gallon)	Emissions (MT)[a]	Emission Factor (kg/gallon)	Emissions (MT)[a]	Emission Factor (kg/gallon)	Emissions (MT)[a]
Construction Equipment Diesel	8,475	1.01E+01	86	4.16E-04	0.00	8.32E-05	0.00
Construction Equipment Gasoline	0	8.80E+00	0	3.73E-04	0.00	7.45E-05	0.00
Total			**86**		**0**		**0**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Table 12-B
Sewer Line Construction Motor Vehicle Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	Total VMT (miles)	CO_2		CH_4		N_2O	
			Emission Factor (kg/gallon)	Emissions (MT)	Emission Factor (g/mi)	Emissions (MT)	Emission Factor (g/mi)	Emissions (MT)
Motor Vehicle Diesel	281	1,540	9.96E+00	3	5.10E-03	0.00	4.80E-03	0.00
Motor Vehicle Gasoline	24,866	475,200	8.55E+00	213	1.50E-02	0.01	1.00E-02	0.00
Total				**215**		**0.01**		**0.00**

Table 12-C
Sewer Line Construction Greenhouse Gas Emissions Summary

Item	CO_2	CH_4	N_2O
Emissions (MT)	301	0.01	0.01
Global Warming Potential[a]	1	21	310
Emissions (MT CO_2e)	301	0	2
Total Emissions (MT CO_2e)	**303**		

[a] From Table 2, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

Table 12-D

Sewer Line Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number				
			Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment							
Compressor, 250 cfm	Diesel	8	2	2	2	2	2
Tractor/Loader/Backhoe	Diesel	3	2	2	2	2	2
Backhoe	Diesel	3	0	0	0	0	0
Crane, 5 ton	Diesel	3	2	2	2	2	2
Welder	Diesel	6	2	2	2	2	2
Vibratory Compactor	Diesel	2	0	0	0	0	0
Roller, 5 ton	Diesel	2	0	0	0	0	0
Motor Vehicles							
Off-Site Vehicles							
Off-Site Dump Trucks	Diesel	40	0	0	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	14	1	1	1	1	1
Off-Site Construction Worker Commute	Gasoline	60	72	72	72	72	72

Table 12-E

Sewer Line Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]				
		Month 1	**Month 2**	**Month 3**	**Month 4**	**Month 5**
Construction Equipment						
Compressor, 250 cfm	Diesel	352	352	352	352	352
Tractor/Loader/Backhoe	Diesel	132	132	132	132	132
Backhoe	Diesel	0	0	0	0	0
Crane, 5 ton	Diesel	132	132	132	132	132
Welder	Diesel	264	264	264	264	264
Vibratory Compactor	Diesel	0	0	0	0	0
Roller, 5 ton	Diesel	0	0	0	0	0
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	Diesel	0	0	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	308	308	308	308	308
Off-Site Construction Worker Commute	Gasoline	95,040	95,040	95,040	95,040	95,040
Motor Vehicle Diesel		**308**	**308**	**308**	**308**	**308**
Motor Vehicle Gasoline		**95,040**	**95,040**	**95,040**	**95,040**	**95,040**

a Based on 22 working days per month

Table 12-F

Sewer Line Construction Monthly Construction Equipment and Motor Vehicle Fuel Use

Equipment/Vehicle Type	Fuel Consumption (gal/hr or gal/mile)	Monthly Fuel Use (gal/month)				
		Month 1	**Month 2**	**Month 3**	**Month 4**	**Month 5**
Construction Equipment						
Compressor, 250 cfm	2.1539	758.2	758.2	758.2	758.2	758.2
Tractor/Loader/Backhoe	2.3717	313.1	313.1	313.1	313.1	313.1
Backhoe	1.4177	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	2.3049	304.2	304.2	304.2	304.2	304.2
Welder	1.2103	319.5	319.5	319.5	319.5	319.5
Vibratory Compactor	2.7075	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	2.7075	0.0	0.0	0.0	0.0	0.0
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.1825	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.1825	56.2	56.2	56.2	56.2	56.2
Off-Site Construction Worker Commute	0.0523	4,973.1	4,973.1	4,973.1	4,973.1	4,973.1
Construction Equipment Diesel		**1,695.0**	**1,695.0**	**1,695.0**	**1,695.0**	**1,695.0**
Construction Equipment Gasoline		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicle Diesel		**56.2**	**56.2**	**56.2**	**56.2**	**56.2**
Motor Vehicle Gasoline		**4,973.1**	**4,973.1**	**4,973.1**	**4,973.1**	**4,973.1**

Note: Totals may not match sum of individual values because of rounding.

Table 13-A
Potable Water Line Construction Construction Equipment Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	CO_2		CH_4		N_2O	
		Emission Factor (kg/gallon)	Emissions (MT)[a]	Emission Factor (kg/gallon)	Emissions (MT)[a]	Emission Factor (kg/gallon)	Emissions (MT)[a]
Construction Equipment Diesel	3,390	1.01E+01	34	4.16E-04	0.00	8.32E-05	0.00
Construction Equipment Gasoline	0	8.80E+00	0	3.73E-04	0.00	7.45E-05	0.00
Total			**34**		**0**		**0**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Table 13-B
Potable Water Line Construction Motor Vehicle Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	Total VMT (miles)	CO_2		CH_4		N_2O	
			Emission Factor (kg/gallon)	Emissions (MT)	Emission Factor (g/mi)	Emissions (MT)	Emission Factor (g/mi)	Emissions (MT)
Motor Vehicle Diesel	112	616	9.96E+00	1	5.10E-03	0.00	4.80E-03	0.00
Motor Vehicle Gasoline	9,946	190,080	8.55E+00	85	1.50E-02	0.00	1.00E-02	0.00
Total				**86**		**0.00**		**0.00**

Table 13-C
Potable Water Line Construction Greenhouse Gas Emissions Summary

Item	CO_2	CH_4	N_2O
Emissions (MT)	121	0.00	0.00
Global Warming Potential[a]	1	21	310
Emissions (MT CO_2e)	121	0	1
Total Emissions (MT CO_2e)	**121**		

[a] From Table 2, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

Table 13-D

Potable Water Line Construction Equipment and Motor Vehicle Numbers

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Monthly Number				
			Month 1	Month 2	Month 3	Month 4	Month 5
Construction Equipment							
Compressor, 250 cfm	Diesel	8	2	2			
Tractor/Loader/Backhoe	Diesel	3	2	2			
Backhoe	Diesel	3	0	0			
Crane, 5 ton	Diesel	3	2	2			
Welder	Diesel	6	2	2			
Vibratory Compactor	Diesel	2	0	0			
Roller, 5 ton	Diesel	2	0	0			
Motor Vehicles							
Off-Site Vehicles							
Off-Site Dump Trucks	Diesel	40	0	0			
Off-Site Pipe Hauling Trucks	Diesel	14	1	1			
Off-Site Construction Worker Commute	Gasoline	60	72	72			

Table 13-E
Potable Water Line Construction Monthly Construction Equipment and Motor Vehicle Use

Equipment/Vehicle Type	Fuel	Monthly Operating Hours or Miles[a]				
		Month 1	**Month 2**	**Month 3**	**Month 4**	**Month 5**
Construction Equipment						
Compressor, 250 cfm	Diesel	352	352	0	0	0
Tractor/Loader/Backhoe	Diesel	132	132	0	0	0
Backhoe	Diesel	0	0	0	0	0
Crane, 5 ton	Diesel	132	132	0	0	0
Welder	Diesel	264	264	0	0	0
Vibratory Compactor	Diesel	0	0	0	0	0
Roller, 5 ton	Diesel	0	0	0	0	0
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	Diesel	0	0	0	0	0
Off-Site Pipe Hauling Trucks	Diesel	308	308	0	0	0
Off-Site Construction Worker Commute	Gasoline	95,040	95,040	0	0	0
Motor Vehicle Diesel		**308**	**308**	**0**	**0**	**0**
Motor Vehicle Gasoline		**95,040**	**95,040**	**0**	**0**	**0**

a Based on 22 working days per month

Table 13-F

Potable Water Line Construction Monthly Construction Equipment and Motor Vehicle Fuel Use

Equipment/Vehicle Type	Fuel Consumption (gal/hr or gal/mile)	Monthly Fuel Use (gal/month)				
		Month 1	**Month 2**	**Month 3**	**Month 4**	**Month 5**
Construction Equipment						
Compressor, 250 cfm	2.1539	758.2	758.2	0.0	0.0	0.0
Tractor/Loader/Backhoe	2.3717	313.1	313.1	0.0	0.0	0.0
Backhoe	1.4177	0.0	0.0	0.0	0.0	0.0
Crane, 5 ton	2.3049	304.2	304.2	0.0	0.0	0.0
Welder	1.2103	319.5	319.5	0.0	0.0	0.0
Vibratory Compactor	2.7075	0.0	0.0	0.0	0.0	0.0
Roller, 5 ton	2.7075	0.0	0.0	0.0	0.0	0.0
Motor Vehicles						
Off-Site Vehicles						
Off-Site Dump Trucks	0.1825	0.0	0.0	0.0	0.0	0.0
Off-Site Pipe Hauling Trucks	0.1825	56.2	56.2	0.0	0.0	0.0
Off-Site Construction Worker Commute	0.0523	4,973.1	4,973.1	0.0	0.0	0.0
Construction Equipment Diesel		**1,695.0**	**1,695.0**	**0.0**	**0.0**	**0.0**
Construction Equipment Gasoline		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Motor Vehicle Diesel		**56.2**	**56.2**	**0.0**	**0.0**	**0.0**
Motor Vehicle Gasoline		**4,973.1**	**4,973.1**	**0.0**	**0.0**	**0.0**

Note: Totals may not match sum of individual values because of rounding.

Table 14-A

Transmission Line Segment 1 Construction Construction Equipment Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)[a]	CH_4 Emission Factor (kg/gallon)	CH_4 Emissions (MT)[a]	N_2O Emission Factor (kg/gallon)	N_2O Emissions (MT)[a]
Construction Equipment Diesel	245,161	1.01E+01	2,486	4.16E-04	0.10	8.32E-05	0.02
Construction Equipment Gasoline	2,800	8.80E+00	25	3.73E-04	0.00	7.45E-05	0.00
Total			**2,511**		**0**		**0**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Table 14-B

Transmission Line Segment 1 Construction Motor Vehicle Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	Total VMT (miles)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)	CH_4 Emission Factor (g/mi)	CH_4 Emissions (MT)	N_2O Emission Factor (g/mi)	N_2O Emissions (MT)
Motor Vehicle Diesel	3,378	20,240	9.96E+00	34	5.10E-03	0.00	4.80E-03	0.00
Motor Vehicle Gasoline	53,570	1,021,328	8.55E+00	458	1.50E-02	0.02	1.00E-02	0.01
Total				**492**		**0.02**		**0.01**

Table 14-C

Transmission Line Segment 1 Construction Greenhouse Gas Emissions Summary

Item	CO_2	CH_4	N_2O
Emissions (MT)	3,002	0.12	0.03
Global Warming Potential[a]	1	21	310
Emissions (MT CO_2e)	3,002	2	10
Total Emissions (MT CO_2e)	**3,014**		

[a] From Table 2, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

Table 14-D
Transmission Line Segment 1 Construction Equipment and Motor Vehicle Mileage and Fuel Use

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Number	Duration (months)	Total Hours or Miles[a]	Fuel Use Rate (gal/hr or gal/mi)	Total Fuel Use (gal)
Construction Equipment							
Marshalling Yards							
Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	4	1	26	2,288	3.67	8,403.8
Loader, Front End, w/ Bucket	Diesel	1	1	26	572	4.86	2,778.2
Forklift, 5 Ton	Diesel	3	1	26	1,716	1.43	2,457.8
Forklift, 10 Ton	Diesel	3	1	26	1,716	1.43	2,457.8
Road Work							
Crawler, Track Type, w/ Blade (D8 type)	Diesel	8	1	4	704	11.81	8,313.2
Motor Grader	Diesel	8	1	4	704	3.44	2,423.7
Foundations							
Drill Rig, Truck Mount	Diesel	8.5	2	12	4,488	8.51	38,170.5
Truck, Flatbed w/Boom, 5 Ton	Diesel	6	2	12	3,168	5.10	16,143.4
Crawler, Track Type, Drill Rig, Pneumatic	Diesel	2	1	12	528	11.81	6,234.9
Concrete Pumper	Diesel	8.5	2	12	4,488	3.70	16,620.5
Loader, Front End, w/ Bucket	Diesel	3.5	1	12	924	4.86	4,487.9
Generator	Gasoline	8.5	2	12	4,488	0.29	1,286.3
Steel							
Crane, Hydraulic, 150 Ton	Diesel	9	2	8	3,168	5.10	16,143.4
Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	9	3	8	4,752	3.67	17,454.1
Truck, Flatbed w/Boom, 5 Ton	Diesel	9	2	8	3,168	5.10	16,143.4
Crawler, Track Type, w/ Blade (D6 type)	Diesel	6	1	8	1,056	5.54	5,854.7
Conductor							
Truck, Flatbed w/Boom, 5 Ton	Diesel	10	3	8	5,280	5.10	26,905.6
Tension Machine	Diesel	2.5	1	8	440	4.86	2,137.1
Truck, Wire Puller, 3 Drum	Diesel	2.5	1	8	440	11.52	5,067.3
Truck, Wire Puller, 1 Drum (OVHD Gr. Wr.)	Diesel	2.5	1	8	440	11.52	5,067.3
Crawler, Track Type, w/ Blade (D8 type)	Diesel	2.5	1	8	440	11.81	5,195.8
Crawler, Track Type, Sagging (D8 type)	Diesel	4	1	8	704	11.81	8,313.2
Backhoe, w/Bucket	Diesel	3.5	1	8	616	2.37	1,460.9
Digger, Transmission Type, Truck Mount	Diesel	1	1	8	176	10.14	1,784.9
Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	10	3	8	5,280	3.67	19,393.4
Generator	Gasoline	10	3	8	5,280	0.29	1,513.3
Cleanup							
Truck, Flatbed w/Boom, 5 Ton	Diesel	8	1	2	352	5.10	1,793.7
Crawler, Track Type, w/ Blade (D6 type)	Diesel	10	1	2	440	5.54	2,439.4
Motor Grader	Diesel	10	1	2	440	3.44	1,514.8
Motor Vehicles							
On-site Vehicles							
Marshalling Yards							
On-Site Semi Tractor	Diesel	5	1	26	2,860	0.183	522.0
On-Site Pickup Truck	Gasoline	5	2	26	5,720	0.052	299.3
On-Site Flatbed Truck	Diesel	5	1	26	2,860	0.072	205.9
Road Work							
On-Site Semi Tractor	Diesel	6	2	4	1,056	0.183	192.7
On-Site Pickup Truck	Gasoline	6	1	4	528	0.052	27.6
Foundations							
On-Site Flatbed Truck, 2 Ton	Gasoline	3	2	12	1,584	0.072	114.0
On-Site Cement Trucks	Diesel	3	4	12	3,168	0.183	578.2
On-Site Semi Tractor	Diesel	3	2	12	1,584	0.183	289.1
On-Site Dump Truck	Diesel	3	2	12	1,584	0.183	289.1
On-Site Watering Truck	Diesel	3	1	12	792	0.183	144.6
On-Site Mechanics Truck	Diesel	3	1	12	792	0.183	144.6
On-Site Pickup Truck	Gasoline	3	2	12	1,584	0.052	82.9
On-Site Flatbed Truck	Gasoline	3	2	12	1,584	0.072	114.0
Steel							
On-Site Flatbed Truck, 2 Ton	Gasoline	3	2	8	1,056	0.072	76.0
On-Site Pickup Truck	Gasoline	3	4	8	2,112	0.052	110.5
On-Site Flatbed Truck	Gasoline	3	2	8	1,056	0.072	76.0
On-Site Semi Tractor	Diesel	3	4	8	2,112	0.183	385.5
On-Site Watering Truck	Diesel	3	1	8	528	0.183	96.4
On-Site Mechanics Truck	Diesel	3	1	8	528	0.183	96.4

Conductor							
On-Site Semi Tractor	Diesel	3	2	8	1,056	0.183	192.7
On-Site Watering Truck	Diesel	3	1	8	528	0.183	96.4
On-Site Flatbed Truck	Gasoline	3	2	8	1,056	0.072	76.0
On-Site Pickup Truck	Gasoline	3	3	8	1,584	0.052	82.9
On-Site Mechanics Truck	Diesel	3	1	8	528	0.183	96.4
Cleanup							
On-Site Dump Truck	Diesel	3	1	2	132	0.183	24.1
On-Site Semi Tractor	Diesel	3	1	2	132	0.183	24.1
On-Site Flatbed Truck	Gasoline	3	1	2	132	0.072	9.5
On-Site Pickup Truck	Gasoline	3	1	2	132	0.052	6.9
Off-Site Vehicles							
Marshalling Yards							
Off-Site Construction Worker Commute	Gasoline	60	6	26	205,920	0.052	10,775.1
Road Work							
Off-Site Construction Worker Commute	Gasoline	60	3	4	15,840	0.052	828.9
Foundations							
Off-Site Construction Worker Commute	Gasoline	60	20	12	316,800	0.052	16,577.1
Steel							
Off-Site Construction Worker Commute	Gasoline	60	28	8	295,680	0.052	15,471.9
Conductor							
Off-Site Construction Worker Commute	Gasoline	60	15	8	158,400	0.052	8,288.5
Cleanup							
Off-Site Construction Worker Commute	Gasoline	60	4	2	10,560	0.052	552.6

a Based on 22 working days per month

Table 15-A
Transmission Line Segment 2 Construction Construction Equipment Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)[a]	CH_4 Emission Factor (kg/gallon)	CH_4 Emissions (MT)[a]	N_2O Emission Factor (kg/gallon)	N_2O Emissions (MT)[a]
Construction Equipment Diesel	76,816	1.01E+01	779	4.16E-04	0.03	8.32E-05	0.01
Construction Equipment Gasoline	919	8.80E+00	8	3.73E-04	0.00	7.45E-05	0.00
Total			**787**		**0**		**0**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Table 15-B
Transmission Line Segment 2 Construction Motor Vehicle Greenhouse Gas Emissions

Fuel	Total Fuel Use (gallons)	Total VMT (miles)	CO_2 Emission Factor (kg/gallon)	CO_2 Emissions (MT)	CH_4 Emission Factor (g/mi)	CH_4 Emissions (MT)	N_2O Emission Factor (g/mi)	N_2O Emissions (MT)
Motor Vehicle Diesel	2,419	13,255	9.96E+00	24	5.10E-03	0.00	4.80E-03	0.00
Motor Vehicle Gasoline	15,095	286,905	8.55E+00	129	1.50E-02	0.00	1.00E-02	0.00
Total				**153**		**0.00**		**0.00**

Table 15-C
Transmission Line Segment 2 Construction Greenhouse Gas Emissions Summary

Item	CO_2	CH_4	N_2O
Emissions (MT)	940	0.04	0.01
Global Warming Potential[a]	1	21	310
Emissions (MT CO_2e)	940	1	3
Total Emissions (MT CO_2e)	**944**		

[a] From Table 2, Appendix A, "SECOND 15-DAY MODIFIED REGULATORY LANGUAGE FOR PUBLIC COMMENT, REGULATION FOR THE MANDATORY REPORTING OF GREENHOUSE GAS EMISSIONS, California Air Resources Board, http://www.arb.ca.gov/regact/2007/ghg2007/ghgattachment1.pdf

Table 15-D
Transmission Line Segment 2 Construction Equipment and Motor Vehicle Mileage and Fuel Use

Equipment/Vehicle Type	Fuel	Hours or Miles/Day	Number	Duration (weeks)	Total Hours or Miles[a]	Fuel Use Rate (gal/hr or gal/mi)	Total Fuel Use (gal)
Construction Equipment							
Marshalling Yards							
Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	5	1	27	675	3.67	2,479.3
Loader, Front End, w/ Bucket	Diesel	1	1	27	135	4.86	655.7
Forklift, 5 Ton	Diesel	7	1	27	945	1.43	1,353.5
Forklift, 10 Ton	Diesel	5	1	27	675	1.43	966.8
Truck, Flatbed w/Boom, 5 Ton	Diesel	7	2	27	1,890	5.10	9,631.0
Road Work							
Crawler, Track Type, w/ Blade (D8 type)	Diesel	8	1	1	40	11.81	472.3
Motor Grader	Diesel	1	1	1	5	3.44	17.2
Tower and Substation Foundation							
Drill Rig, Truck Mount	Diesel	7.5	3	6	675	8.51	5,740.9
Truck, Flatbed w/Boom, 5 Ton	Diesel	5	2	6	300	5.10	1,528.7
Crawler, Track Type, Drill Rig, Pneumatic	Diesel	2	1	6	60	11.81	708.5
Loader, Front End, w/ Bucket	Diesel	3.5	1	6	105	4.86	510.0
Generator	Gasoline	7.5	4	6	900	0.29	257.9
Steel							
Crane, Hydraulic, 150 Ton	Diesel	9	2	14	1,260	5.10	6,420.7
Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	9	3	14	1,890	3.67	6,942.0
Truck, Flatbed w/Boom, 5 Ton	Diesel	9	2	14	1,260	5.10	6,420.7
Crawler, Track Type, w/ Blade (D6 type)	Diesel	6	1	14	420	5.54	2,328.6
Conductor							
Truck, Flatbed w/Boom, 5 Ton	Diesel	9	3	9	1,215	5.10	6,191.4
Tension Machine	Diesel	2.5	1	9	113	4.86	546.4
Truck, Wire Puller, 3 Drum	Diesel	2.5	1	9	113	11.52	1,295.6
Truck, Wire Puller, 1 Drum (OVHD Gr. Wr.)	Diesel	2.5	1	9	113	11.52	1,295.6
Compressor	Gasoline	5	1	9	225	0.96	216.7
Crawler, Track Type, w/ Blade (D8 type)	Diesel	2.5	1	9	113	11.81	1,328.5
Crawler, Track Type, Sagging (D8 type)	Diesel	4	1	9	180	11.81	2,125.5
Backhoe, w/Bucket	Diesel	3.5	1	9	158	2.37	373.5
Digger, Transmission Type, Truck Mount	Diesel	1	1	9	45	10.14	456.4
Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	9	3	9	1,215	3.67	4,462.7
Generator	Gasoline	9	3	9	1,215	0.29	348.2
Cleanup							
Truck, Flatbed w/Boom, 5 Ton	Diesel	5	1	4	100	5.10	509.6
Backhoe, w/Bucket	Diesel	3	1	4	60	2.37	142.3
Compressor	Gasoline	5	1	4	100	0.96	96.3
Crawler, Track Type, w/ Blade (D6 type)	Diesel	7.5	1	4	150	5.54	831.6
Motor Grader	Diesel	7.5	1	4	150	3.44	516.4
Wreck-Out							
Truck, Flatbed w/Boom, 5 Ton	Diesel	9	2	5	450	5.10	2,293.1
Truck, Wire Puller, 1 Drum	Diesel	9	1	5	225	11.52	2,591.3
Crawler, Track Type, w/ Blade (D6 type)	Diesel	9	1	5	225	5.54	1,247.4
Truck, Manlift	Diesel	9	3	5	675	5.10	3,439.6
Backhoe, w/Bucket	Diesel	9	1	5	225	2.37	533.6
Crane, Hydraulic, Rough Terrain, 30 Ton	Diesel	5	1	5	125	3.67	459.1
Generator	Gasoline	1	2	5	50	0.29	14.3
On-site Vehicles							
Marshalling Yards							
On-Site Semi Tractor	Diesel	5	3	27	2,025	0.183	369.6
On-Site Pickup Truck	Gasoline	5	3	27	2,025	0.052	106.0
On-Site Dump Truck	Diesel	5	1	27	675	0.183	123.2
Road Work							
On-Site Semi Tractor	Diesel	11	2	1	110	0.183	20.1
On-Site Pickup Truck	Gasoline	11	1	1	55	0.052	2.9

Tower and Substation Foundation							
On-Site Flatbed Truck, 5 Ton	Gasoline	11	2	6	660	0.072	47.5
On-Site Cement Trucks	Diesel	11	8	6	2,640	0.183	481.9
On-Site Semi Tractor	Diesel	11	2	6	660	0.183	120.5
On-Site Dump Truck	Diesel	11	2	6	660	0.183	120.5
On-Site Watering Truck	Diesel	11	1	6	330	0.183	60.2
On-Site Mechanics Truck	Diesel	11	1	6	330	0.183	60.2
On-Site Pickup Truck	Gasoline	11	2	6	660	0.052	34.5
On-Site Flatbed Truck	Gasoline	11	2	6	660	0.072	47.5
Steel							
On-Site Flatbed Truck, 2 Ton	Gasoline	3	2	14	420	0.072	30.2
On-Site Pickup Truck	Gasoline	3	4	14	840	0.052	44.0
On-Site Flatbed Truck	Gasoline	3	2	14	420	0.072	30.2
On-Site Semi Tractor	Diesel	3	4	14	840	0.183	153.3
On-Site Watering Truck	Diesel	3	1	14	210	0.183	38.3
On-Site Mechanics Truck	Diesel	3	1	14	210	0.183	38.3
Conductor							
On-Site Semi Tractor	Diesel	11	2	9	990	0.183	180.7
On-Site Watering Truck	Diesel	11	1	9	495	0.183	90.4
On-Site Flatbed Truck	Gasoline	11	2	9	990	0.072	71.3
On-Site Pickup Truck	Gasoline	11	3	9	1,485	0.052	77.7
On-Site Mechanics Truck	Diesel	11	1	9	495	0.183	90.4
Cleanup							
On-Site Dump Truck	Diesel	11	2	4	440	0.183	80.3
On-Site Semi Tractor	Diesel	11	1	4	220	0.183	40.2
On-Site Flatbed Truck	Gasoline	11	1	4	220	0.072	15.8
On-Site Pickup Truck	Gasoline	11	1	4	220	0.052	11.5
Wreck-Out							
On-Site Dump Truck	Diesel	11	2	5	550	0.183	100.4
On-Site Watering Truck	Diesel	11	1	5	275	0.183	50.2
On-Site Flatbed Truck, 5 Ton	Gasoline	11	3	5	825	0.072	59.4
On-Site Semi Tractor	Diesel	11	3	5	825	0.183	150.6
On-Site Mechanics Truck	Diesel	11	1	5	275	0.183	50.2
On-Site Pickup Truck	Gasoline	11	3	5	825	0.052	43.2
Off-Site Vehicles							
Marshalling Yards							
Off-Site Construction Worker Commute	Gasoline	60	6	27	48,600	0.052	2,543.1
Road Work							
Off-Site Construction Worker Commute	Gasoline	60	3	1	900	0.052	47.1
Tower and Substation Foundation							
Off-Site Construction Worker Commute	Gasoline	60	29	6	52,200	0.052	2,731.5
Steel							
Off-Site Construction Worker Commute	Gasoline	60	24	14	100,800	0.052	5,274.5
Conductor							
Off-Site Construction Worker Commute	Gasoline	60	17	9	45,900	0.052	2,401.8
Cleanup							
Off-Site Construction Worker Commute	Gasoline	60	6	4	7,200	0.052	376.8
Wreck-Out							
Off-Site Construction Worker Commute	Gasoline	60	14	5	21,000	0.052	1,098.9

a Based on 5 working days per week

Table 16
Greenhouse Gas Emissions Summary

Construction Element	**CO_2 Equivalent Emissions (MT)[a]**
Combined Cycle Facility Construction	5,640
Solar Array Construction	6,084
Reclaimed Water Line Construction	1,919
Natural Gas Pipeline Construction	2,591
Sewer Line Construction	303
Potable Water Line Construction	121
Transmission Line Segment 1 Construction	3,014
Transmission Line Segment 2 Construction	944
Total Emissions	**20,616**

[a] MT = metric tonne = 1,000 kg = 2,205 lb

Air Quality

Attachment DR-100A/100B

AVAQMD Concurrence on PHPP Emission Reduction Credit Strategy

Antelope Valley
Air Quality Management District

Antelope Valley Air Quality Management District
43301 Division St., Suite 206
Lancaster, CA 93535-4649

661.723.8070
Fax 661.723.3450

Eldon Heaston, Executive Director

April 28, 2009

Michael J. Carroll
Latham & Watkins LLP
650 Town Center Drive, 20th Floor
Costa Mesa, CA 92626-1925

Re: Palmdale Hybrid Power Plant Project Emission Reduction Credit Strategy

Dear Mr. Carroll:

The Antelope Valley Air Quality Management District (District) has reviewed your April 24, 2009 correspondence presenting an emissions offset strategy for the proposed Palmdale Hybrid Power Plant Project, on behalf of the City of Palmdale. The District concurs that the emissions offset strategy presented in that correspondence (essentially the use of ozone precursors transferred from the San Joaquin Valley Air Pollution Control District and the use of PM_{10} reductions generated from the paving of local existing unpaved roads) is valid and viable.

If you have any questions regarding this letter, please contact me at (760) 245-1661, extension 6726.

Sincerely,

Alan J. De Salvio
Supervising Air Quality Engineer

AJD PHPPOffsetStrategy.doc

650 Town Center Drive, 20th Floor
Costa Mesa, California 92626-1925
Tel: +1.714.540.1235 Fax: +1.714.755.8290
www.lw.com

LATHAM&WATKINS LLP

April 24, 2009

Mr. Alan De Salvio
Supervising Air Quality Engineer
Antelope Valley Air Quality Management District
43301 Division St., Suite 206
Lancaster, CA 93535-4649

Re: Palmdale Hybrid Power Plant Project – Emission Reduction Credit (ERC) Strategy

Dear Mr. De Salvio:

As you are aware, the City of Palmdale ("City") has filed an Application for Certification (AFC) with the California Energy Commission for the Palmdale Hybrid Power Plant Project (08-AFC-9). The Project is located within the jurisdictional boundaries of the Antelope Valley Air Quality Management District ("District") and will result in certain NO_x, VOC, and PM_{10} emissions that must be offset with ERCs in compliance with District rules.

To offset the Project's NO_x and VOC emissions, the City initially intended to obtain ERCs from the South Coast Air Quality Management District (SCAQMD) Priority Reserve. As you are aware, recent court actions have rendered the Priority Reserve ERCs currently unavailable. As an alternative offset strategy, the City has identified sufficient quantities of ERCs to satisfy Project demand for both NO_x and VOC within the San Joaquin Valley Air Pollution Control District (SJVAPCD) that are available for purchase. The City's negotiations for such ERCs have advanced enough for the City to be confident that the ERCs can satisfy the Project's requirements.

To offset the Project's PM_{10} emissions, the City intends to generate PM_{10} ERCs by paving roads in compliance with an expected District road-paving rule. This rule would be modeled after the Mohave Desert Air Quality Management District Rule 1406. Based on our communications with District counsel, the expected road-paving rule will be introduced to the District Board in the very near future.

LATHAM & WATKINS LLP

The purpose of this letter is to obtain your concurrence on the general validity of the City's offset strategy, as discussed above. If you have any questions, please do not hesitate to contact me.

Very truly yours,

Michael J. Carroll
of LATHAM & WATKINS LLP

650 Town Center Drive, 20th Floor
Costa Mesa, California 92626-1925
Tel: +1.714.540.1235 Fax: +1.714.755.8290
www.lw.com

LATHAM & WATKINS LLP

April 24, 2009

Mr. Alan De Salvio
Supervising Air Quality Engineer
Antelope Valley Air Quality Management District
43301 Division St., Suite 206
Lancaster, CA 93535-4649

Re: Palmdale Hybrid Power Plant Project –
Emission Reduction Credit (ERC) Strategy

Dear Mr. De Salvio:

As you are aware, the City of Palmdale ("City") has filed an Application for Certification (AFC) with the California Energy Commission for the Palmdale Hybrid Power Plant Project (08-AFC-9). The Project is located within the jurisdictional boundaries of the Antelope Valley Air Quality Management District ("District") and will result in certain NO_x, VOC, and PM_{10} emissions that must be offset with ERCs in compliance with District rules.

To offset the Project's NO_x and VOC emissions, the City initially intended to obtain ERCs from the South Coast Air Quality Management District (SCAQMD) Priority Reserve. As you are aware, recent court actions have rendered the Priority Reserve ERCs currently unavailable. As an alternative offset strategy, the City has identified sufficient quantities of ERCs to satisfy Project demand for both NO_x and VOC within the San Joaquin Valley Air Pollution Control District (SJVAPCD) that are available for purchase. The City's negotiations for such ERCs have advanced enough for the City to be confident that the ERCs can satisfy the Project's requirements.

To offset the Project's PM_{10} emissions, the City intends to generate PM_{10} ERCs by paving roads in compliance with an expected District road-paving rule. This rule would be modeled after the Mohave Desert Air Quality Management District Rule 1406. Based on our communications with District counsel, the expected road-paving rule will be introduced to the District Board in the very near future.

LATHAM&WATKINS LLP

The purpose of this letter is to obtain your concurrence on the general validity of the City's offset strategy, as discussed above. If you have any questions, please do not hesitate to contact me.

Very truly yours,

Michael J. Carroll
of LATHAM & WATKINS LLP

Air Quality

Attachment DR-108

EPA Completeness Determination Emails

From: Head, Sara
Sent: Monday, April 20, 2009 8:59 PM
To: 'Rivera.Shirley@epamail.epa.gov'; Shalev.Omer@epamail.epa.gov
Cc: Allen Cadreau; 'Tony Penna'; 'Roy Xu'; Kingsley, Russ
Subject: EPA questions on the PSD permit application

Shirley and Omer -

Here are a few answers to your question on the PHPP PSD application from our phone call last week:

1. Figure 2-4 General Arrangement Power Block from Kiewit shows a Fuel Gas Heater. Will the heater be electric or will it burn fuel?
Neither, it will be fed by steam from the auxiliary boiler during start-up and IP extraction water during plant Operation. This is part of the GE rapid response plant requirements.

2. Do we have manufacturer's specifications (spec sheets) for the boiler, heater, emergency generator of fire-water pump engine?
We do not have any information for Palmdale. The equipment for Palmdale is likely to be similar to Victorville -- Proposals have been obtained for the Victorville boiler, but a bidder has not been selected. I have attached the data sheets from the apparent front runner at the time work was suspended. Emergency Generator or Fire Water Pump data had not yet been obtained when work was suspended.

3. Are the calculations done at HHV or LHV?
Please see assumptions at the bottom of emissions calculations in Appendix B. For instance, Tables 2 and 3 indicates "HHV 1024 Btu/scf" and Table 4 and 5 indicate "Heating value NG 1,024 Btu/scf". From these notes, it is concluded that HHV was used for the calculations.

4. Do the PM10 emissions include both front and back half for the combustion turbines?
Yes, the PM10 emissions for the combustion turbines include both front and back half.

Please let me know if you have additional questions or if you will need other analyses that you are considering.

Sara

Sara J. Head, QEP
AECOM Environment
T 805-388-3775 ext 227
C 805-320-8059
sara.head@aecom.com

3.0 BOILER DESIGN DATA

Boiler Dimensions:		**Units**
Height to Main Steam Outlet	11 Ft 6 In	FT
Overall Width of Unit	9 Ft 8.5 In	FT
Overall Length of Unit*	15 Ft 4 In	FT
**Add approximately 6-8 ft length for burner.*		
Weight of Unit (Dry)	40,250	LBS
Weight of Unit (Wet)	50,250	LBS
Surface Area / Volume:		**Units**
Furnace Volume	558	FT3
Furnace Projected Area	409	FT2
Evaporator Area	1,428	FT2
Total Area	1,836	FT2
Economizer Area	3,204	FT2
Tubing Data:		**Units**
Tube OD	2.0	IN
Tube Wall Thickness – Furnace Section	0.120	IN
Tube Wall Thickness – Convection Section	0.120	IN
Tube Material	SA-178A	
Corrosion Allowance	NA	IN
Steam Drum:		**Units**
Inside Drum Diameter:	36 In	IN
Drum Length	15.33 Ft. Seam/Seam	FT
Drum Material:	SA-516 Grade 70	
Corrosion Allowance:	NA	IN
Water Drum:		**Units**
Drum Diameter:	24 In	IN
Drum Length	15.33 Ft. Seam/Seam	FT
Drum Material:	SA-106 Grade B	
Corrosion Allowance:	NA	IN
Standard Drum Connections:	**Quantity**	**Type**
Main Steam Outlet:	One	BW
Safety Valves:	Per ASME Code	Flanged
Feedwater Inlet:	One	Flanged
Bottom Drum Blowoff:	Two	Flanged
Water Column:	Two	SW
Feedwater Regulator:	Two	Flanged
Vent:	One	SW
Continuous Blowdown:	One	SW
Chemical Feed:	One	SW
Sootblower:	Two	Flanged
Auxiliary L.W. Cutouts:	One	SW

**The above information is preliminary and shall be confirmed at time of engineering submittal.*

4.0 BOILER PERFORMANCE DATA

Fuel: Natural Gas

Boiler load - %	**100%**	**90%**	**80%**	**70%**	**60%**	**Units**
Steam Flow - ¤	25,000	22,500	20,000	17,500	15,000	Lb/Hr
Steam Pressure – Operating - ¤	285.3	285.3	285.3	285.3	285	PSIG
Steam Temperature - ¤	417.0	417.0	417.0	417.0	417.0	°F
Fuel Input (HHV)	34.6	31.1	27.6	24.1	20.6	MMBTU/Hr
Ambient Air Temperature	77.0	77.0	77.0	77.0	77.0	°F
Relative Humidity	40	40	40	40	40	%
Excess Air	30	30	30	30	30	%
Flue Gas Recirculation	30	30	30	30	30	%
Steam Output Duty	29	26	23	20	17	MMBTU/hr
Heat Release Rate	61,965	55,624	49,322	43,066	36,852	BTU/FT3-Hr
Heat Release Rate	84,774	76,098	67,477	58,919	50,417	BTU/FT2-Hr
Deaerator Pegging Steam	3,300	2,970	2,640	2,310	1,980	Lb/Hr
Feed Water Temperature	228	228	228	228	228	°F
Water Temp. Leaving Economizer	347	342	336	329	323	±10°F
Blow Down	3.0	3.0	3.0	3.0	3.0	%
Boiler Gas Exit Temperature	650	626	600	575	548	±10°F
Economizer Gas Exit Temp.	331	321	310	300	290	±10°F
Air Flow	32,731	29,382	26,053	22,749	19,466	Lb/Hr
Flue Gas to Stack	34,319	30,807	27,317	23,852	20,410	Lb/Hr
Flue Gas Including FGR	44,615	40,049	35,512	31,008	26,533	Lb/Hr
Fuel Flow	1,587	1,425	1,263	1,103	944	Lb/Hr
Flue Gas Losses/Efficiency-%						
Dry Gas Loss	5.4	5.2	5.0	4.8	4.6	%
Air Moisture Loss	0.1	0.1	0.1	0.1	0.1	%
Fuel Moisture Loss	10.8	10.8	10.7	10.7	10.6	%
Casing Loss	0.5	0.6	0.6	0.7	0.8	%
Margin	0.5	0.5	0.5	0.5	0.5	%
Efficiency - LHV	91.6	91.8	92.1	92.3	92.4	%
Efficiency – HHV - ¤	82.7	82.9	83.1	83.3	83.4	%
Total Pressure Drop Including Economizer	7.99	6.42	5.02	3.81	2.8	IN WC
Products of Combustion - CO_2	7.5	7.5	7.5	7.5	7.5	%
- H_2O	15.7	15.7	15.7	15.7	15.7	%
-N_2	72.4	72.4	72.4	72.4	72.4	%
-O_2	4.4	4.4	4.4	4.4	4.4	%
-SO_2	-	-	-	-	-	%
GAS- % volume	**NG**					
methane	90.00					
ethane	5.00					
nitrogen	5.00					
LHV-Btu/lb	19,687					
HHV-Btu/lb	21,815					

**The above information is preliminary and shall be confirmed at time of engineering submittal.*

Fuel: Natural Gas

Boiler load - %	**50%**	**40%**	**30%**	**20%**	**10%**	**Units**
Steam Flow - ¤	12,500	10,000	7,500	5,000	2,500	Lb/Hr
Steam Pressure – Operating - ¤	285	285	285	285	285	PSIG
Steam Temperature - ¤	417.0	417.0	417.0	417.0	417.0	°F
Fuel Input (HHV)	17.1	13.7	10.3	7.0	3.6	MMBTU/Hr
Ambient Air Temperature	77.0	77.0	77.0	77.0	77.0	°F
Relative Humidity	40	40	40	40	40	%
Excess Air	30	30	35	40	45	%
Flue Gas Recirculation	30	30	30	30	30	%
Steam Output Duty	14	11	9	6	3	MMBTU/hr
Heat Release Rate	30,679	24,545	18,496	12,449	6,412	BTU/FT3-Hr
Heat Release Rate	41,971	33,580	25,305	17,031	8,773	BTU/FT2-Hr
Deaerator Pegging Steam	1,650	1,320	990	660	330	Lb/Hr
Feed Water Temperature	228	228	228	228	228	°F
Water Temp. Leaving Economizer	316	309	306	303	303	±10°F
Blow Down	3.0	3.0	3.0	3.0	3.0	%
Boiler Gas Exit Temperature	520	492	469	447	429	±10°F
Economizer Gas Exit Temp.	280	271	264	256	248	±10°F
Air Flow	16,205	12,965	10,146	7,081	3,778	Lb/Hr
Flue Gas to Stack	16,991	13,594	10,620	7,400	3,942	Lb/Hr
Flue Gas Including FGR	22,088	17,672	13,806	9,620	5,125	Lb/Hr
Fuel Flow	785	628	473	318	164	Lb/Hr
Flue Gas Losses/Efficiency-%						
Dry Gas Loss	4.4	4.2	4.2	4.2	4.1	%
Air Moisture Loss	0.1	0.1	0.1	0.1	0.1	%
Fuel Moisture Loss	10.6	10.5	10.5	10.5	10.4	%
Casing Loss	1.0	1.3	1.7	2.5	5.0	%
Margin	0.5	0.5	0.5	0.5	0.5	%
Efficiency - LHV	92.5	92.5	92.1	91.2	88.5	%
Efficiency – HHV - ¤	83.5	83.5	83.1	82.3	79.9	%
Total Pressure Drop Including Economizer	1.9	1.2	0.7	0.3	0.1	IN WC
Products of Combustion - CO2	7.5	7.5	7.2	7.0	6.7	%
- H2O	15.7	15.7	15.2	14.7	14.3	%
-N2	72.4	72.4	72.6	72.8	73.0	%
-O2	4.4	4.4	5.0	5.5	6.0	%
-SO2	-	-	-	-	-	%
GAS- % volume	**NG**					
methane	90.00					
ethane	5.00					
nitrogen	5.00					
LHV-Btu/lb	19,687					
HHV-Btu/lb	21,815					

**The above information is preliminary and shall be confirmed at time of engineering submittal.*

AUXILIARY BOILER FILL-IN DATA

In addition to other data and descriptive material furnished with Bidder's proposal, Bidder shall fill in all spaces of the following Fill-In Data Section:

FULL-LOAD PERFORMANCE DATA:		25,000 lb/hr UNIT
Steam Flow Out (gross)	lb/hr.	30,000
Operating Steam Pressure at Outlet	psia	300
Steam Temperature at Outlet	°F	419 Sat.
Maximum Heat Input	MMBtu/hr	36.57 HHV
Boiler Design Pressure	psig	400
Excess Air Supplied for Combustion	%	15
Number of burner(s) in use		1
Quantities		
Fuel	lb/hr	1594
Flue Gas Leaving Boiler	lb/hr	32,302
Air Entering Furnace	lb/hr	30,708
Blowdown Rate Included in Boiler Input	lb/hr	900
Flue Gas Recirculation	lb/hr	9690
Temperature of Flue Gas to Stack	°F	300
Fuel Gas Flow	lb/hr	1594
Air Resistance	in H_2O	
Forced Draft Fan to Furnace		
Including Fan Inlet		9
Draft Losses	in H_2O	
Furnace through Expansion Joint		
At boiler Flue Gas Outlet		1.24
Breeching and Flues		0.2
Air Heater		N/A
Economizer		1.1
Stack		Nil

Heat Losses	%		
Dry Gas		4.12	
H_2 and H_2O in Fuel		10.59	
Moisture in Air		0.11	
Unburned Combustibles			
Radiation		0.5	
Unaccounted for & Manufacturing Margin		1.0	
Total Heat Loss			
Efficiency of Unit	%	16.32	
Input to Furnace	Btu/hr	32.57	
Input per Square Foot Furnace surface	Btu/hr	75,631	
Furnace Liberation	Btu/cu.ft./hr	54,592	
KW Input to forced Draft Fan Drive Motor			
Emissions			
NO_x as NO_2 ppmdv @ 3% 0_2 (averaged over one hour)			9.0
CO ppmdv @ 3% 0_2 (averaged over one hour)			50
VOC as CH_4 lb/hr, lb/MMBtu			.055, 0.0015
SO_X as SO_2 lb/hr, lb/MMBtu (based on 0.2 grains/100 dscf fuel sulfur)			.022, 0.0006
PM10 (front and back half) lb/hr, lb/MMBtu			0.18, 0.005
Feedwater @ interface			
Required flow	lb/hr		30,900
Required pressure	psig		
		SCFM	PSIG
Air Requirements			
Sealing			
Cooling			
Aspirating			

Control System		
TECHNICAL DATA:		
Furnace Water Wall Heating Surface	sq. ft.	458
Projected tube area		
Boiler Convection Heating Surface	sq. ft.	2203
Furnace Volume	cu. ft.	660
Furnace Width (center-center tubes)	ft	6.5
Furnace Depth (center-center tubes)	ft	14.0
Boiler size	(LxWxH)	See Drawing
Furnace Wall Tubes		
Tube Material		SA 178 A
Size (OD)	in	2
Nominal wall thickness	in	0.135
Insulation and Lagging		
Boiler		
Insulation Material / Thickness		Min Wool / 4"
Lagging Material / Thickness		peb. grain alluminum
Economizer		
Insulation Material / Thickness		min wool / 3"
Lagging Material / Thickness		peb. grain alluminum
Breeching and Flue		
Insulation Material / Thickness		min wool / 2"
Lagging Material / Thickness		peb. grain alluminum
Type of Furnace Construction		
Side walls		Membrane
Rear wall		Membrane
Front wall		Membrane
Floor		Membrane
Forced-draft Fan		

Manufacturer		Chicago	
Catalog Identification		PFD	
Performance		Net	Test Block
Capacity	lb/hr	Fan Data	
Static pressure	in H_2O	To Follow	
Temperature	°F		
RPM			
Horsepower required			
Voltage			
Bearing Type			
WK^2	lbs-ft. sq		
Fan shop-mounted on boiler assembly?	(Yes/No)		
Fan Silencers			
Manufacturer			
Model or Identification Number			
Motors			
Manufacturer			
Model No. Frame Size			
Motor Horsepower			
Motor Voltage			
Motor Service Factor			
Enclosure Type			
Starting Torque			
Current at Rated Voltage	amperes		
Full Load			
Locked Rotor			
Winding RTD's			
Total Number			

Type		
Bearing Thermocouples		
Total Number		
Type		
Starting Torque		
Flue Gas Recirculating Fan		N/A
Manufacturer		
Catalog Identification		
Performance		
Capacity	lbs/hr ACFM	
Static pressure	in H_2O	
Temperature	°F	
RPM		
Horsepower Required		
Bearing Type		
WK^2	lbs-ft sq	
Motors		
Manufacturer		
Model No. Frame Size		
Motor Horsepower		
Motor Voltage		
Motor Service Factor		
Enclosure Type		
Starting Torque		
Current at Rated Voltage	amperes	
Full Load		
Locked Rotor		
Winding RTD's		
Total Number		

Type	N/A
Bearing Thermocouples	
Total Number	
Type	
Starting Torque	
Burners	
Number of Burners	1
Manufacturer	Coen / TODD
Type	Ultra Low NOx
Pressures Required at Terminal Pt. psig	10
Design Firing Rate	36.6
Turn Down Ratio	6:1
Maximum Fuel Flow lb/hr	1594
Ignition Electrical Energy Required	
Volts	
Amperes	
Scanners	
Manufacturer	Coen
Type	UV
Quantity	2
BMS Panel Processor	
Manufacturer	Allen Bradley
Model	CompactLogix
Economizer	

Manufacturer			Kentube or Eql.
FW Temperature In	°F		228
FW Temperature Out	°F		336
Tube Material			SA 178 A
Tube Wall Thickness	in		0.105
Corrosion Allowance	in		
Valves and Trim	Manufacturer	Size inches	Catalog Identification
Feedwater Control Valve	Fisher		
Feed Stop	Velan	2	F08-1054C
Feed Check	Velan	2	F08-1114C
Blowoff	Edward	1½	1441
Blowdown	Vogt	3/4	SW12443
Drum vent	Velan	1"	W05-2074B
Drain	Velan		W04-2054B
Steam Sampling	"		"
Drum Water Sampling	"		"
Chemical Feed	"	"	"
Lower Drum Heater Control Valve	TBD		
Face Steam Coil Air Heater Control	N/A		
Fuel Flow control Valve	Fisher		
Master Fuel Trip Valve		3"	
Main Steam Stop Valve	Velan	6"	F15-1064C
Safety Valves			
Manufacturer	Consolidated		
Model No.	1811		
Size	in		
Outlet			2½
Inlet			1½

Set Pressure	psig	TBD	
Accumulation	psi	"	
Capacity at saturated Temperature	lbs/hr	"	
Main Steam Outlet Connection		Diameter	Length
Size	in	6"	
Rating	in	300	
Type	in	Flanged	
Drum Diameter/Length/ Inches			
Steam Drum		36"/16'/	
Lower Drum		24/16'/	
Retention Time at MCR (NWL to LW Cutoff)	minutes		
Drum Wall Thickness	in		
Steam Drum		1"	
Lower Drum(s)		3/4"	
Corrosion Allowance	in	1/16"	
Drum Connections size	in		
Water Gauge		1 1/2"	
Steam Pressure Gauge		1"	
Feedwater inlet		2"	
Test		1"	
Nitrogen Blanketing		1"	
Drum Level Controller		1"	
Chemical Feed		1"	
Steam Sample			
Water Sample		1"	
Blowoff		1 1/2"	
Blowdown		1"	
Safety Valve		1 1/2"	
Drum Vent		1"	

Drain			
Controls - Manufacturer			
Combustion		Allen Bradley	
Feedwater		CompactLogix	
Light-off and safety		"	
Panelboards		"	
Flue Gas Recirculation	%	30	
Indicators (List all Below)		Number	Function
		Through	
		Touch	screen
Stack			
Stack Diameter	in	30	
Stack Height	ft	60' total	
Manufacturer / Supplier		Rentech	
Stack Wall Thickness	in	1/4	
Corrosion Allowance	in	1/16	
Gallons water required to fill boiler			
Normal Operating Level		1220	
Hydrostatic Testing			
Gallons Water Required			
To Fill Pressure Parts		1951	
Recommended Water Temperature	°F		
Weight	lbs		
Boiler Assembly Complete (empty)		55,000	
Forced Draft Fan and Motor Drive		6000	

Boiler Operating Weight	72,000	
Control Panel		
Flues		
Stack		
Allowable Forces and Moments at	Moments	Forces
Feedwater Connection	To Follow	
Main Steam Pipe		
Feed Pipe		
Flue Gas Outlet Flange		
Control System Power Requirements		
Volts		
KVA		
ERECTION:		
Erection Tools	N/A	

Bidder shall list here all special tools provided by Bidder for the unloading, hauling and erection of all equipment furnished.

None Required

PERFORMANCE GUARANTEES:

When the boiler and accessory equipment are operated using the specified fuel and based on other values tabulated in this Specification, the Bidder guarantees that at full-rated capacity:

The combined efficiency of the boiler unit will be not less than 83.6 percent.

Total power input to the forced-draft fan motor will not exceed _____ kilowatts at rated conditions or _____ kilowatts at test block.

Total pressure drop between inlet to feedwater stop-check valve and Contractor's main steam terminal on the boiler will not exceed _____ psi.

Steam purity shall not exceed ____ ppb.

Emissions rates shall be in conformance with the requirements stated in the Technical Specifications and Appendix C.

The burner system and associated controls shall be capable of a stable, continuous modulating control range of at least 10 to 1 turndown when operating on the fuel gas as specified in Appendix A.

The net steam flow at the terminal point will be 25,000 lb/hr saturated steam at 300 psia.

The maximum heat input required will not exceed _______ MMBtu/hr.

NOISE LEVEL: (all equipment, ducts, etc.)
Maximum equivalent A-weighted sound level, dBA at 3ft. from equipment boundary: 85

ASME QUALIFICATIONS:

Bidder's ASME Code Certificate No.: See Attached

Certificate type: ________________________

Expiration date of certificate: ________________________

END OF SECTION

End of Email Attachment

From: Head, Sara
Sent: Thursday, April 23, 2009 6:44 PM
To: 'Rivera.Shirley@epamail.epa.gov'; Shalev.Omer@epamail.epa.gov
Cc: Allen Cadreau; Tony Penna; Roy Xu; Kingsley, Russ
Subject: RE: FW: EPA questions on the PSD permit application

Shirley and Omer -

In response to your additional questions below, here are our responses:

1) We have chosen the stack parameters and modeling approach to be representative and provide conservative, worst case results for the analysis. For instance, see the discussion on Stack Parameters that begins on the bottom of page 6-3: "... a worst-case composite of emissions and stack data were developed for each of the four load cases to simply and add a measure of conservatism to the analysis."...

We understand if the stack parameters change once the plant goes to final design, that we would need to demonstrate that the impacts were equal to or less than those analyzed in terms of significance or other regulatory thresholds.

2) Our proposed emission rates for the combustion turbines are consistent with the proposed PM10 test method language. We agree with the proposed language but would also suggest adding the words: ... "or using a modified, equivalent or alternative test method as approved by the Administrator" in case even better methods are developed in the future.

Let us know if you have further questions.

Sara

Sara J. Head, QEP
AECOM Environment
T 805-388-3775 ext 227
C 805-320-8059
sara.head@aecom.com

From: Rivera.Shirley@epamail.epa.gov [mailto:Rivera.Shirley@epamail.epa.gov]
Sent: Tuesday, April 21, 2009 9:26 AM
To: Head, Sara
Cc: Shalev.Omer@epamail.epa.gov; Allen Cadreau; Tony Penna; Roy Xu; Kingsley, Russ
Subject: Re: FW: EPA questions on the PSD permit application

Sara,

Thanks for the quick responses; totally appreciated. I'm out of the office and actually returning Thursday. (I've updated my out-of-office messages.) I wanted to get back to you given I believe my out-of-office may have had me back in the office tomorrow (Wednesday).

A quick thought on the equipment/mfr specs - I understand the specifics are pending. I don't recall if I mentioned this during our chat. One reason we are interested in this is at least for AQ modeling purposes - that what is used for parameters are representative, accurate, worst case, etc. (e.g., mass rate, temp, stack ID, etc).

I (or Omer) will later just check-in with Carol Bohnenkamp on this. And perhaps the way to address this is just for us (EPA) to provide a comment about implications down the road if parameters change.

And on the particulate matter estimates, we had the following proposed for Victorville 2 test methods ...

iv. EPA Methods 5 and 202 for both PM and PM10 (as a surrogate for PM2.5), in accordance with the test methods set forth in 40 CFR § 60.8 and 40 CFR Part 60, Appendix A. In lieu of Method 202, the Permittee may use EPA Conditional Test Methods for particulate matter: CTM-039 or OTM-027. If Method 202 is used, the test methodology must include:
a. one hour nitrogen purge
b. the alternative procedure described in section 8.1 to neutralize the sulfuric acid
c. evaporation of the last 1 ml of the inorganic fraction by air drying following evaporation of the bulk of the impinger water in a 105 ºC oven as described in the first sentence of section 5.3.2.3.

So ... I just wanted to confirm up front (and I'm sure you all thought of this also) that your particulate matter estimates would be o.k. with these test methods. (I'm thinking no problem.)

Nevertheless, thanks much and talk/type later,

- Shirl

Shirley F. Rivera
T: (415) 972-3966 | F: (415) 947-3579 | **Rivera.Shirley@epa.gov**
U.S. EPA, Region 9, Air Permits Office (AIR-3) | 75 Hawthorne St., San Francisco, CA 94105

Air Quality

Attachment DR-112/113

GE Rapid Response Start-up/Shutdown Times and Emissions

5. Rapid Response – Supplemental

5.1 Expected Startup Times

The charts provided show the expected start times for the Rapid Response 207FA Combined Cycle Plant.

5.1.1 Basis of Curves

The start sequence has assumed the plant is designed for sequential rather than simultaneous startup of both gas turbines. The second gas turbine is not started until the first gas turbine has reached full speed no load with an additional short time period for electrical switching. This has been found to be the most commonly adopted approach and has some advantages. The plant could be structured for simultaneous start as an option.

Sequenced or staggered starting prevents the LCIs of both gas turbines from drawing maximum power from the grid at the same time, which essentially doubles the plant starting power. This operation typically determines the demand charge the plant will have assigned. Staggered start reduces the demand charge rate. The higher plant electrical input power for a simultaneous start also would require larger plant electrical equipment such as auxiliary transformers and switchgear.

An improved steam turbine loading rate resulting from the expanded flexibility of the Rapid Response combined cycle system design is incorporated into the hot start curve. This starting method will improve warm and cold starts also however pending further analysis and testing to accurately quantify the benefits no capability beyond conventional combined cycle plant steam turbine rates have been reflected in the warm and cold start curves here. The system will be designed to include the new method on those starts and provide the improvement available.

No low load hold of the gas turbine is needed on a hot or warm start and none is included in those curves. A short hold has been included in the cold start as a conservative measure for the HRSG stress and life concerns.

Given that the number of cold starts in a year are expected to be few, the impact on a yearly basis is very small.

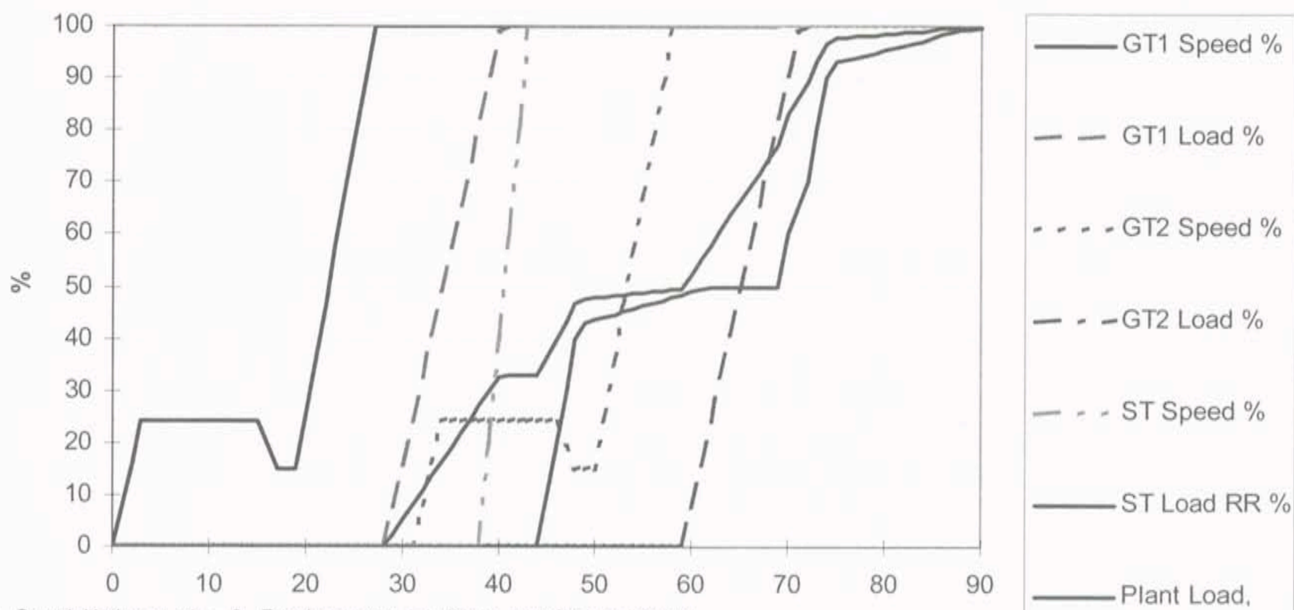
The curves assume a "ready to start" condition has been previously achieved. This includes steam seals applied, vacuum established, condenser sparged, fuel heating system warmed up and ready to supply heated fuel to the gas turbine, pre-start HRSG drum levels and hotwell levels established, condensate and boiler feed pumps running (when required both 100% redundant pumps running) and controls in auto.

No holds for steam purity are included (none are anticipated following other than an extended shutdown). The times shown assume a fully automated plant startup without operator induced holds or turbine acceleration or loading reductions. Start times are representative for a correctly operating plant.

Start times in between 8 hours shutdown and 48 hours shutdown, or between 48 hours shutdown and 72 hours shutdown can generally be estimated by interpolation of the start times at these three points.

Typical Rapid Response 207FA Hotstart

(startup after 8hr shutdow n or less)

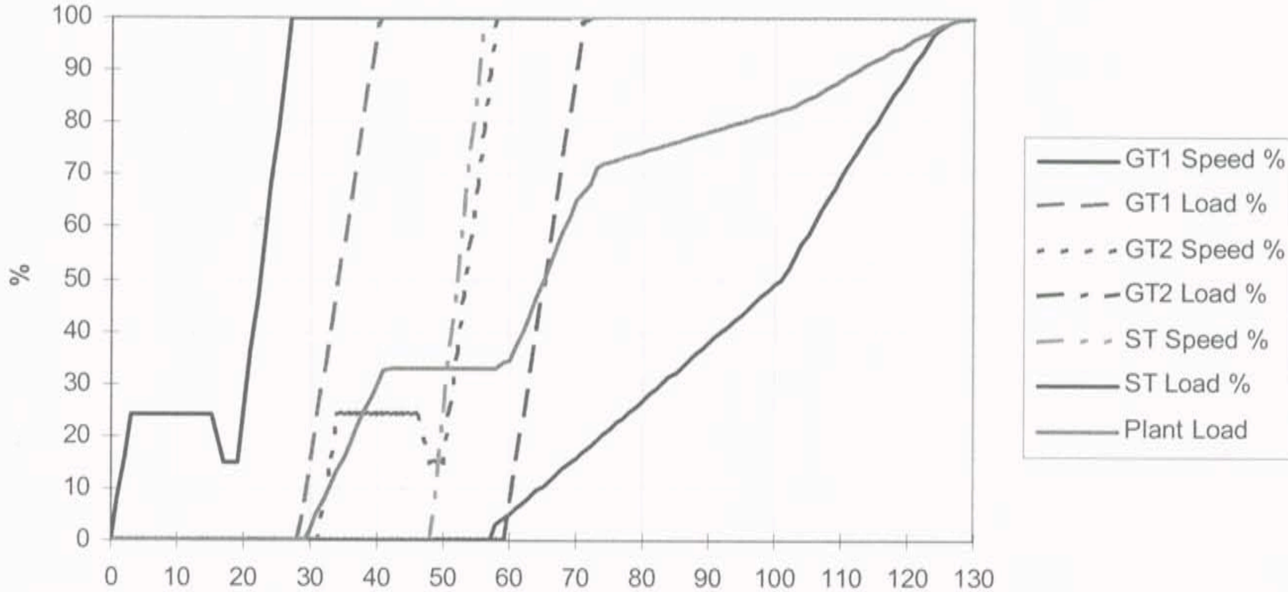


*1 Start initiation at min = 0. Ready to start conditions satisfied previously.

*2 GT base load operation at exhaust temp control spec limit, full open compressor IGV position. ST valves full open.

Typical Rapid Response 207FA Warmstart

(startup after 48hr shutdow n)



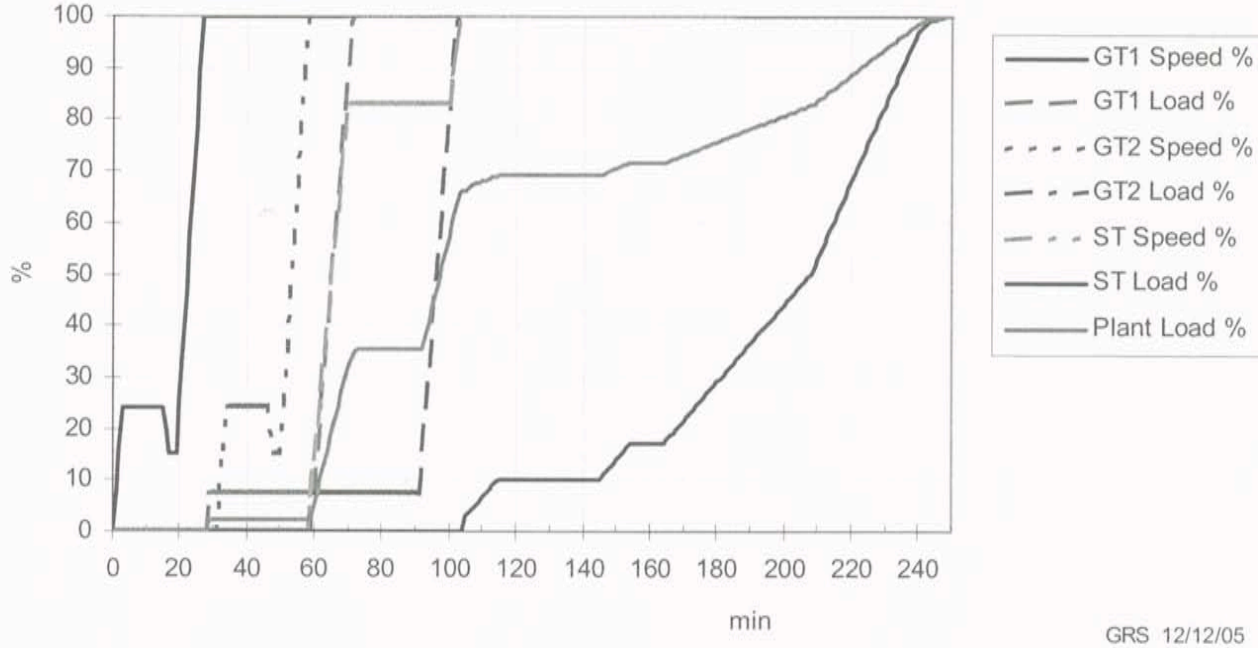
*1 Start initiation at min = 0. Ready to start conditions satisfied previously.

*2 GT base load operation at exhaust temp control spec limit, full open compressor IGV position, ST valves full open.

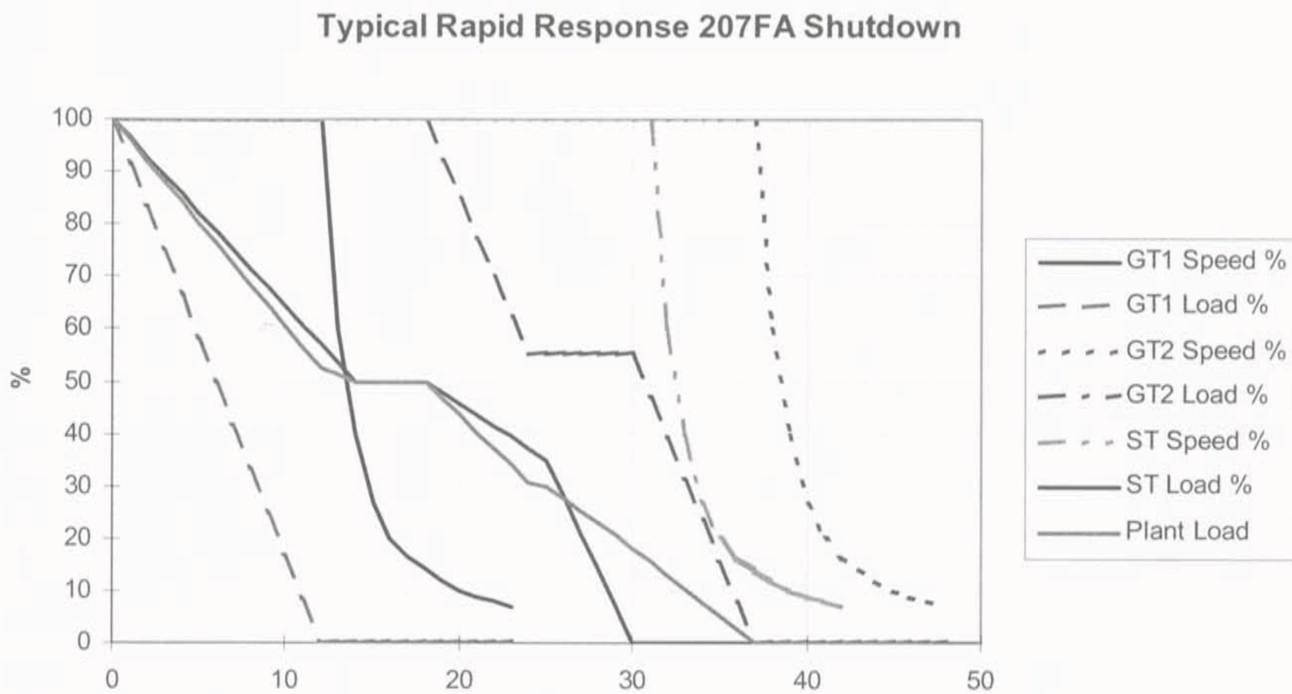
GRS 02/24/06

Typical Rapid Response 207FA Coldstart

(startup after 72hr shutdow n or longer)



GRS 12/12/05



*1 Start initiation at min = 0. Ready to start conditions satisfied previously.
*2 GT base load operation at exhaust temp control spec limit, full open compressor IGV position. ST valves full open.

GRS 02/24/06

5.2 Estimated Startup & Shutdown Emissions

The following startup emissions values are estimated. They are based on the gas turbine starting profiles as shown in the attached hot, warm and cold startup curves. No reduction of gas turbine emissions by the SCR or CO catalysts is included. Startup values are from gas turbine firing to base load. Shutdown values are from base to gas turbine flameout. All values are per gas turbine.

Start Type	NOx as NO2, lbs	CO, lbs	VOC as CH4, lbs
Hotstart & Warmstart	40	329	28
Coldstart	96	410	31
Shutdown	57	337	29

5.3 Overall Plant Design Considerations

The Rapid Response Plant gas turbine and steam turbine starting profiles, and the resulting start times, emissions and revenue benefits, are achieved only with the necessary overall plant combined cycle system design. Certain portions of the physical plant, which impact the turbine starting profiles, are not supplied by GE in this proposal. In order to assure the anticipated profiles and associated benefits are achieved it is of the up most importance that GE specifications and guidelines for the necessary equipment and plant outside GE's scope be designed and constructed in accordance with GE's instruction. Key areas include,

1. Steam bypasses
2. Steam drains system
3. Auxiliary steam system including auxiliary boiler
4. HRSG steam sampling system
5. HRSG water treatment system
6. Gas turbine fuel heating system

GE will provide functional specifications and piping data blocks that must be followed to avoid negatively impacting the startup times and voiding associated guarantees. GE will review and approve critical engineering including,

1. Steam and condensate P&IDs
2. Steam piping isometrics
3. Plant layout and equipment arrangement
4. Key equipment purchase specifications including the auxiliary boiler, condensate pumps, boiler feed pumps, drain valves, control valves, instrumentation and gas turbine fuel supply equipment.

Air Quality

Attachment DR-114

Air Modeling Files

- Please see separate file folders
(AERMOD)
(BPIP)
(Ozone Background Files)

ENSR
2 Technology Park Drive, Westford, Massachusetts, 01886-3140
T 978.589.3000   F 978.589.3100 www.ensr.aecom.com

Modeling Files for the Inland Energy – Palmdale Hybrid Power Project
CEC Set 2 Request Responses
Palmdale, CA - July, 2008

1. Base directory: Includes this Read Me file and the following subdirectories:

2. Ozone Background Files: Contains the hourly NO_2 background data for each of the 3 years modeled for use with the AERMOD OLM method.

3. BPIP – This folder contains the GEP/BPIP input, output and summary files for all of the emission points.

4. AERMOD Folder – This folder contains the AERMOD input and output files for the 3 years (2002-2004) modeled for this project. The runs are broken into several subfolders:

   Normal Operations: This folder contains the modeling runs for normal operations and includes all of the PHPP Project sources. The folder contains a subfolder for each of the criteria pollutants included in the modeling.

   Startup / Shutdown: Contains the modeling of the combustion turbines and the ancillary equipment during periods where the turbines are being shutdown or brought on-line.

   Cumulative Runs: This folder contains the cumulative modeling runs include the sources from nearby Lockheed-Martin Aeronautics and Northrop-Grumman as requested by Antelope Valley Air Quality Management District (AVAQMD). There is a subfolder for each pollutant and period modeled. In addition the folders for Annual NO_2 and PM10 and 24-hour PM10 include runs that include the off-site sources but remove the receptors on their properties, along with runs that do not include the off-site sources but include the entire grid. The results of the two sets of runs were then compared and the highest impact of the two was reported in the results.

   Construction: The folder contains all of the modeling files pertaining to the PHPP construction modeling. A subfolder is included for each pollutant and period that was modeled.

   Note: For the subfolders that contain NO_2 modeling runs, the following additional files will be included: The output files from the AERMOD “MAXIFILE” option listing all results that, when added to the maximum NO_2 ambient background value, would result in an exceedence of the CAAQS. This data was used to determine what hours of construction would not cause impacts that would exceed the standard. Also included will be a spreadsheet where the time matched backgrounds were added to the modeled impacts to determine the overall impacts.

STATE OF CALIFORNIA
ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

In the Matter of:	Docket No. 08-AFC-9
Application for Certification, for the CITY OF PALMDALE HYBRID POWER PLANT PROJECT	**PROOF OF SERVICE LIST** (Revised April 30, 2009)

APPLICANT

Laurie Lile
Assistant City Manager
City of Palmdale
38300 North Sierra Highway, Suite A
Palmdale, CA 93550
llile@cityofpalmdale.org

Thomas M. Barnett
Executive Vice President
Inland Energy, Inc.
3501 Jamboree Road
South Tower, Suite 606
Newport Beach, CA 92660
tbarnett@inlandenergy.com

Antonio D. Penna Jr.
Vice President
Inland Energy
4390 Civic Drive
Victorville, CA 92392
tonypenna@inlandenergy.com

APPLICANT'S COUNSEL

Michael J. Carroll
Marc Campopiano
Latham & Watkins, LLP
650 Town Center Drive, Suite 2000
Costa Mesa, CA 92626
Michael.carroll@lw.com
Marc.campopiano@lw.com

INTERESTED PARTIES

Manuel Alvarez
Robert J. Tucker
Southern California Edison
1201 K Street
Sacramento, CA 95814
Manuel.Alvarez@sce.com
Robert.Tucker@sce.com

Rick Buckingham
3310 El Camino Avenue, LL-90
State Water Project,
Power & Risk Office
Sacramento, CA 95821
rbucking@water.ca.gov
(Email Preferred)

INTERESTED AGENCIES

California ISO
P.O. Box 639014
Folsom, CA 95763-9014
e-recipient@caiso.com
(Email Preferred)

Michael R. Plaziak
Lahontan Regional
Water Quality Control Board
14440 Civic Drive, Suite 200
Victorville, CA 92392-2306
mplaziak@waterboards.ca.gov

ENERGY COMMISSION

Jeffrey D. Byron
Commissioner and Presiding
Member
jbyron@energy.state.ca.us

Arthur H. Rosenfeld
Commissioner and Associate
Member
pflint@energy.state.ca.us

Paul Kramer
Hearing Officer
pkramer@energy.state.ca.us

Felicia Miller
Project Manager
FMiller@energy.state.ca.us

Caryn Holmes
Staff Counsel
CHolmes@energy.state.ca.us

Elena Miller
Public Adviser
Publicadviser@energy.state.ca.us

PALMDALE HYBRID POWER PROJECT
CEC Docket No. 08-AFC-9

DECLARATION OF SERVICE

I, Sara J. Head, declare that on May 1, 2009, I served and filed copies of the attached:

PALMDALE HYBRID POWER PROJECT: RESPONSES TO CEC DATA REQUEST SET 2 (91-162) AND SUPPLEMENTAL RESPONSE #4 TO CEC DATA REQUEST SET 1

To all parties on the Proof of Service List above in the following manner:

California Energy Commission Docket Unit

☒ Transmission by depositing one original signed document and twelve (12) copies, including electronic files on CDs, with same day mail delivery service at Camarillo, California with delivery fees thereon fully prepaid and addressed to the following:

CALIFORNIA ENERGY COMMISSION
Attn: DOCKET NO. 08-AFC-9
1516 Ninth Street, MS-15
Sacramento, California 95814-5512
docket@energy.state.ca.us

For Service to All Other Parties

☒ by depositing one paper copy and CD with the United States Postal Service via first class mail at Camarillo, California with postage fees thereon fully prepaid and addressed as provided on the Proof of Service list to those addresses **NOT** marked "email preferred."

I further declare that the transmittal via same day delivery and U.S. mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210.

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 9, 2009, at Camarillo, California

Sara J. Head

Sara J. Head